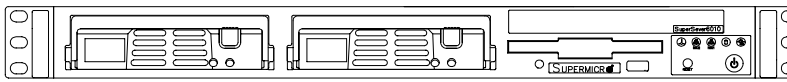
SUPERMICRO®

SUPERSERVER 6010H



USER'S MANUAL

Revision 1.1a

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 6010H. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 6010H is a high-end dual processor 1U rackmount server based on the SC810 1U rackmount server chassis and the 370DER+, a dual processor motherboard that supports either one or two 370-pin Pentium III FCPGA processors and up to 4 GB SDRAM main memory.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the SUPER 370DER+ mainboard and the SC810 chassis, which make up the SuperServer 6010H.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 6010H into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 6010H.

Chapter 5: Advanced Motherboard Setup

Chapter 5 provides detailed information on the 370DER+ motherboard, including the locations and functions of connections, headers, jumpers, DIP switches and IRQs. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the motherboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC810 1U rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SCSI or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS Error Beep Codes and Messages

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Appendix C: List of Figures

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Chapter 1

Introduction to the SuperServer 6010H

1-1 Overview

The Supermicro SuperServer 6010H is a high-end dual processor, 1U rackmount server that features some of the most advanced technology currently available. The SuperServer 6010H is comprised of two main subsystems: the SC810 1U rackmount chassis and the 370DER+ dual 370-pin Pentium III FCPGA processor mainboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperServer 6010H. (www.supermicro.com)

In addition to the mainboard and chassis, various hardware components may have been included with your SuperServer 6010H, as listed below.

- Up to two (2) 370-pin Pentium III FCPGA processors*
- Two (2) CPU heat sinks*
- Up to 4 GB SDRAM main memory*
- One (1) 1.44" floppy drive
- One (1) slim CD-ROM drive
- One (1) control panel PCB
- One (1) SCA SCSI backplane
- Two (2) SCA SCSI drive carriers
- SCSI Accessories
  One (1) internal 68-pin Ultra160 SCSI cable for SCA SCSI backplane
  One (1) set of SCSI driver diskettes
  One (1) SCSI manual
- One (1) 3.3V 64-bit, 66 MHz PCI riser card (installed)
- One (1) 5V 64/32-bit, 33 MHz PCI riser card (bundled)

- Rackmount hardware (with screws):
  Two (2) rack rail assemblies
  Six (6) brackets for mounting the rack rails to a rack/telco rack

- One (1) CD-ROM containing drivers and utilities:
  Intel's LANDesk Client Manager
  Intel's LANDesk Server Manager
  ATI Rage XL AGP graphics controller driver
  LAN driver
  SCSI driver

- SuperServer 6010H User's Manual

** Type and number depends upon the configuration ordered.*

1-2 Server Chassis Features

The SuperServer 6010H is a high-end, scaleable 1U rackmount server platform designed with today's most state-of-the-art features. The following is a general outline of the main features of the SC810 chassis.

System Power

When configured as a SuperSever 6010, the SC810 chassis includes a 250W power supply.

SCSI Subsystem

The SCSI subsystem supports two 80-pin SCA Ultra160 SCSI hard drives. (Any standard 1" drives are supported. SCA = Single Connection Attachment.) The SCSI drives are connected to an SCA backplane that provides power, bus termination and configuration settings. The SCSI drives are also hot-swap units.

Control Panel

The SC810's control panel provides important system monitoring and control information. LEDs indicate power on, network activity, hard disk drive activity and system overheat conditions. The control panel also includes a main power button and a system reset button.

I/O Shield

The SC810 is a 1U rackmount chassis. Its I/O shield provides one motherboard expansion slot, one COM port (the other is internal), two USB ports, PS/2 mouse and keyboard ports, a graphics port and two Ethernet ports. (See Figure 1-1.)

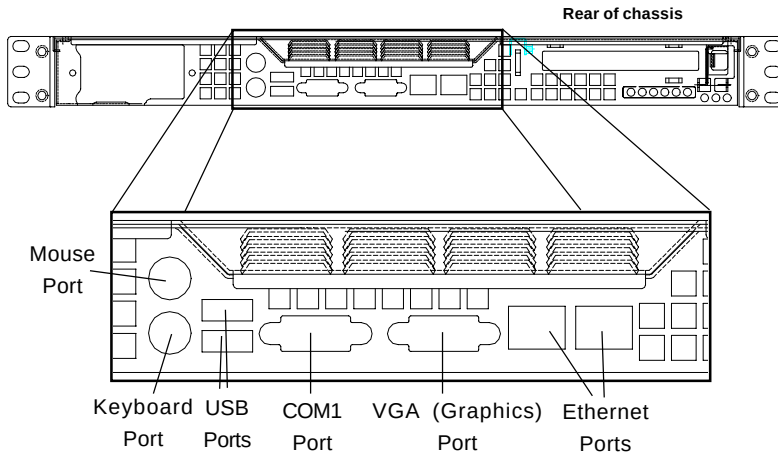

Figure 1-1. I/O Shield

Cooling System

The SC810 chassis has an innovative cooling design that includes a 10-cm blower system cooling (intake) fan and one optional 4-cm fan that can be installed in the midsection of the chassis. The blower fan plugs into a chassis fan header on the motherboard and operates at full rpm continuously. If it breaks down, the ambient air temperature inside the chassis will rise and activate an overheat LED.

1-3 Mainboard Features

At the heart of the SuperServer 6010H lies the 370DER+, a dual processor motherboard designed to provide maximum performance. Below are the main features of the 370DER+.

Chipset

The 370DER+ is based on the ServerWorks ServerSet™ III HE SL chipset, which is a high-performance core logic chipset that consists of a North Bridge and a South Bridge.

The North Bridge integrates the main memory subsystem and a dual channel PCI bus and bridges the processor bus to a 64-bit PCI bus. The memory subsystem consists of a two-way interleaved 4-DIMM configuration accessed over a 144-bit memory bus (most chipsets have a 72-bit memory bus), which provides a significant boost in performance. The North Bridge also packs and unpacks data for PCI accesses to reserve more processor bandwidth for multiprocessor motherboards.

The South Bridge provides various integrated functions, including the PCI to ISA bridge and support for UDMA33, security (passwords and system protection), Plug & Play, USBs, power management, interrupt controllers and the SMBus.

Processors

The 370DER+ supports single or dual 370-pin Pentium III FCPGA 500 MHz-1 GHz processors with a 133 or 100 MHz FSB. Please refer to the support section of our web site for a complete listing of supported processors (http://www.supermicro.com/TechSupport.htm).

Memory

The 370DER+ has 4 DIMM slots that can support up to 4 GB of ECC registered PC133 and PC100 SDRAM. Module sizes of 128MB, 256MB, 512MB and 1 GB may be used to populate the DIMM slots. The DIMM slots are situated at a 25 degree angle to create a low profile and to promote efficient airflow through the chassis. A two-way interleaved memory scheme is employed for increased performance.

Onboard SCSI

Onboard SCSI is provided with an Adaptec AIC-7899 SCSI controller chip, which supports dual channel, Ultra160 SCSI at a burst throughput rate of 160 MB/sec for each channel. The 370DER+ provides three SCSI ports: two internal 68-pin LVD Ultra160 connectors (on channels A and B) and one external 68-pin Ultra160 SCSI connector (shared with channel B).

PCI Expansion Slots

The 370DER+ has one 64-bit 66 MHz slot. Two riser cards are included with the system for use with 64-bit and 32-bit PCI cards.

ATI Rage XL PCI Graphics Controller

An onboard ATI graphics controller based on the Rage XL graphics chip is integrated into the 370DER+. This onboard graphics controller includes 8 MB of onboard memory and fully supports sideband addressing. This onboard graphics package provides a bandwidth of up to 512 MB/sec over a 32-bit graphics memory bus.

Onboard Controllers/Ports

An onboard IDE controller supports one floppy drive and up to four UDMA/33 hard drives or ATAPI devices. Onboard I/O ports include two COM ports, two USB ports, PS/2 mouse and keyboard ports, a video (monitor) port and a two 10/100 MB Ethernet (NIC) ports, which back each other up in case one port loses connection. The 370DER also has an onboard ATI graphics controller (see above).

Other Features

Other onboard features that promote system health include eight voltage monitors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

1-4 Contacting Supermicro

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Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 6010H up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your SuperServer 6010H system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a motherboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the SuperServer 6010H

You should inspect the box the SuperServer 6010H was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the SuperServer 6010H. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the SuperServer 6010H was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location:

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

Warnings and Precautions!

Rack Precautions:

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions:

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug SCSI drives and power supply units to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

2-4 Installing the SuperServer 6010H into a Rack

This section provides information on installing the SuperServer 6010H into a rack unit. If the 6010H has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the 6010H into a rack with the rack rails provided. You should also refer to the installation instructions that came with the rack unit you are using.

Identifying the Sections of the Rack Rails:

You should have received two rack rail assemblies with the SuperServer 6010H. Each of these assemblies consist of two sections: an inner fixed chassis rail that secures to the 6010H (A) and an outer fixed rack rail that secures directly to the rack itself (B). A sliding rail guide sandwiched between the two should remain attached to the fixed rack rail. (See Figure 2-1.) The A and B rails must be detached from each other to install.

To remove the fixed chassis rail (A), pull it out as far as possible - you should hear a "click" sound as a locking tab emerges from inside the rail assembly and locks the inner rail. Then depress the locking tab to pull the inner rail completely out. Do this for both the left and right side rack rail assemblies.

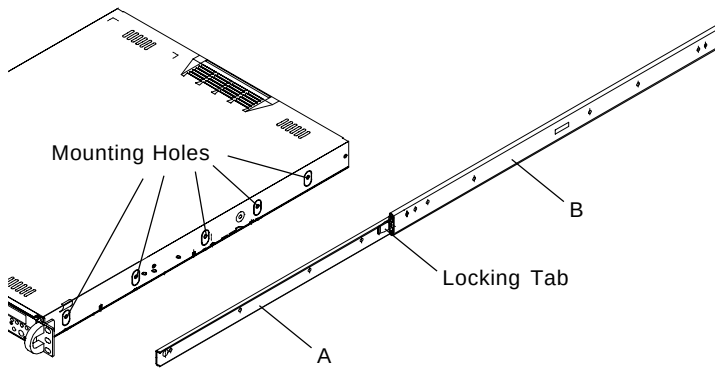


Figure 2-1. Identifying the Sections of the Rack Rails

Installing the Chassis Rails:

Position the fixed chassis rail sections you just removed along the side of the 6010H chassis making sure the five screw holes line up. Note that these two rails are left/right specific. Screw the rail securely to the side of the chassis (see Figure 2-2). Repeat this procedure for the other rail on the other side of the chassis. You will also need to attach the rail brackets when installing into a telco rack.

Locking Tabs: As you have seen, both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

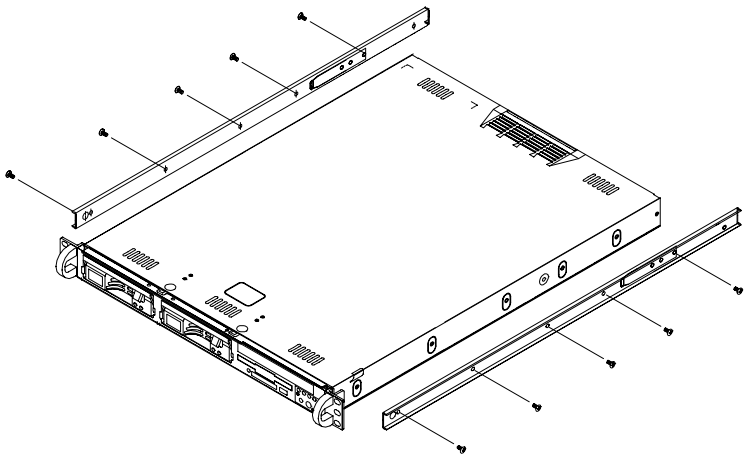


Figure 2-2. Installing Chassis Rails

Installing the Rack Rails:

Determine where you want to place the SuperServer 6010H in the rack. (See Rack and Server Precautions in Section 2-3.) Position the fixed rack rail/sliding rail guide assemblies at the desired location in the rack, keeping the sliding rail guide facing the inside of the rack. Screw the assembly securely to the rack using the brackets provided. Attach the

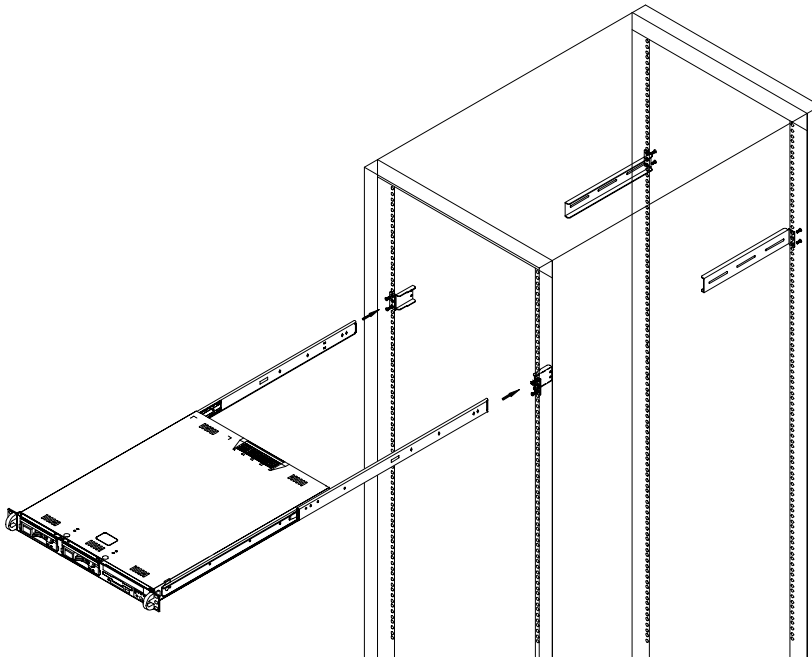
other assembly to the other side of the rack, making both are at the exact same height and with the rail guides facing inward.

Installing the Server into the Rack:

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the chassis. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). See Figure 2-3.

When the server has been pushed completely into the rack, you should hear the locking tabs "click". Finish by inserting and tightening the thumbscrews that hold the front of the server to the rack.

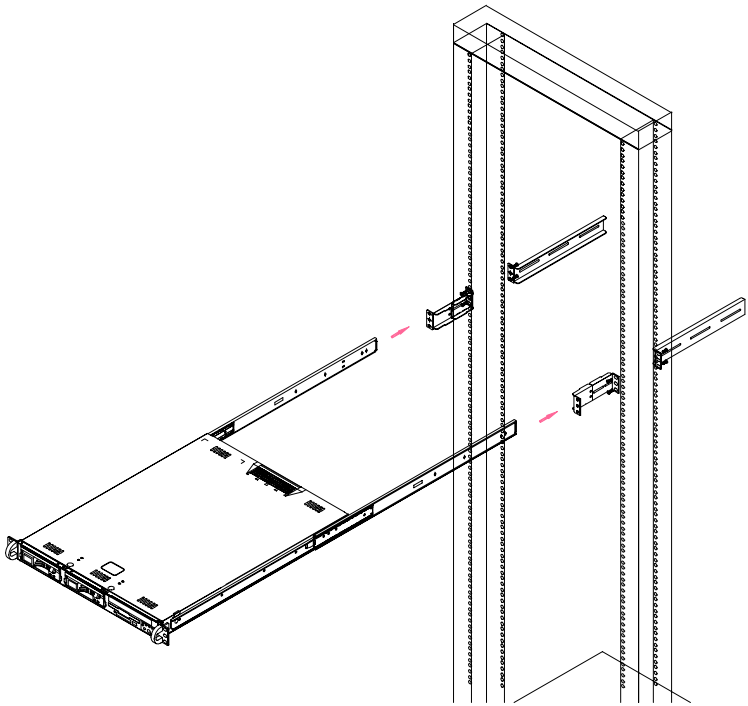
Figure 2-3. Installing the Server into a Rack



Installing the Server into a Telco Rack:

If you are installing the SuperServer 6010H into a Telco type rack, follow the directions given on the previous pages for rack installation. The only difference in the installation procedure will be the positioning of the rack brackets to the rack. They should be spaced apart just enough to accomodate the width of the telco rack.

Figure 2-4. Installing the Server into a Telco Rack



2-5 Checking the Motherboard Setup

After you install the 6010H in the rack, you will need to open the unit to make sure the motherboard is properly installed and all the connections have been made.

1. Accessing the inside of the 6010H (see Figure 2-5):

First, release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover. There is a large rectangular recess in the middle front of the top cover to help you push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

2. Check the CPUs (processors):

You should have one or two processors already installed into the system board. Each processor should have its own heatsink attached. See Section 5-5 for instructions on processor installation.

3. Verify the proper CPU core/bus ratio setting:

You need to verify that the CPU core/bus ratio as set with DIP Switch 1 matches the speed of your installed processors. This DIP Switch is defaulted to 5.5, which corresponds to 550 MHz processors running on a 100 MHz front side bus (FSB). If the setting is different or if you are using processors of a different speed, you may need to change this setting. (See Section 5-9 for setting the core/bus ratio with DIP Switch 1.)

4. Check the system memory:

Your 6010H server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Section 5-6.

5. Installing add-on cards:

If desired, you can install an add-on card to the system. See Section 5-7 for details on installing a PCI add-on card.

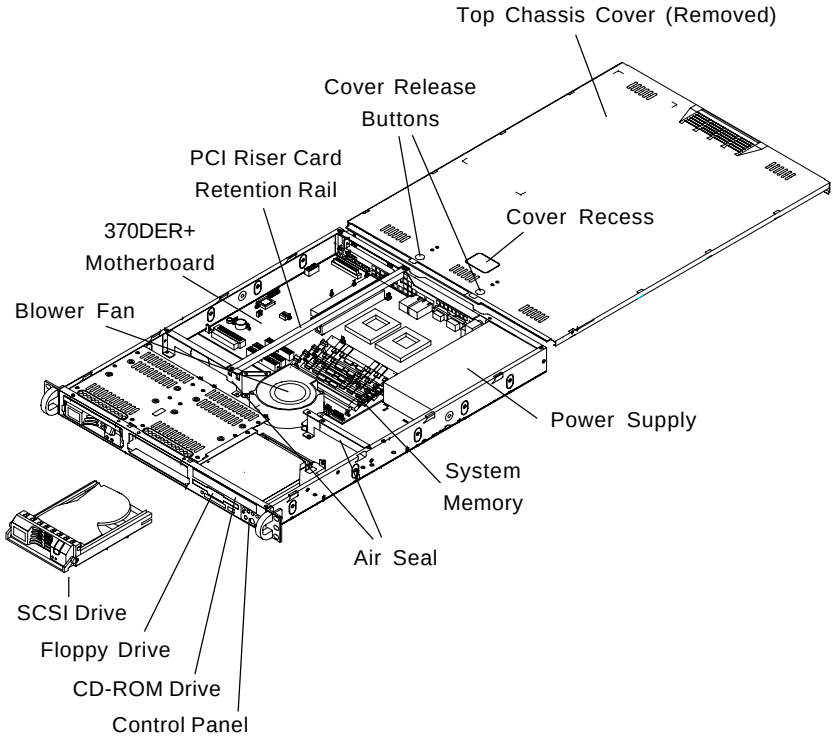


Figure 2-5. Accessing the Inside of the SuperServer 6010H (with one SCSI Drive removed)

6. Check all cable connections and airflow:

Make sure all power and data cables are properly connected and not blocking the airflow. See Section 5-3 for details on cable connections. Also, check the air seals for damage. The air seals are located under the blower fan and beneath the frame cross section that separates the drive bay area from the motherboard area of the chassis.

2-6 Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the SCSI drives and SCA backplane have been properly installed and all connections have been made.

1. Accessing the drive bays:

All drives can be accessed from the front of the server. For servicing the CD-ROM and floppy drives, you will need to remove the top chassis cover. The SCSI disk drives can be installed and removed from the front of the chassis without removing the top chassis cover.

2. Installing a CD-ROM and floppy disk drives:

Refer to Section 6-4 if you need to reinstall a CD-ROM and/or floppy disk drive to the system.

3. Check the SCSI disk drives:

Depending upon your system's configuration, your system may have one or two SCSI drives already installed. If you need to install SCSI drives, please refer to Section 6-4.

4. Check the airflow:

Airflow is provided by a 10-cm input fan and one (optional) 4-cm cooling fan. The system component layout was carefully designed to promote sufficient airflow through the small 1U rackmount space. Also note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

5. Supplying power to the system:

The last thing you must do is to provide input power to the system. Plug the power cord from the power supply unit into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).

Chapter 3

System Interface

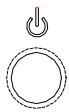
3-1 Overview

There are several LEDs on the control panel as well as others on the SCSI drive carriers and the motherboard to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel and an on/off switch on the power supply. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

3-2 Control Panel Buttons

There are two push-button buttons located on the front of the chassis. These are (in order from left to right) a reset button and a power on/off button.

- **RESET:** The reset switch reboots the system.



- **POWER:** This is the main power switch, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system. (See also the power supply on/off switch in Section 3-5.)

3-3 Control Panel LEDs

The control panel located on the front of the SC810 chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

- **Overheat:** Indicates an overheat condition in the chassis. This may be caused by cables obstructing the airflow in the system, or the ambient room temperature being too warm. You should also check to make sure that the chassis cover is installed and that all fans are present and operating normally. Finally, check the air seals for damage. The air seals are located under the blower fan and beneath the frame cross section that separates the drive bay area from the motherboard area of the chassis.

NIC2

- **NIC2:** Indicates network activity on LAN2 when flashing.

NIC1

- **NIC1:** Indicates network activity on LAN1 when flashing.

- **HDD:** Indicates IDE channel activity. On the SuperServer 6010H, this light indicates CD-ROM drive activity when flashing.

- **Power:** Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

3-4 SCSI Drive Carrier LEDs

Each SCSI drive carrier has two LEDs.

- **Green:** When illuminated, the green LED on the front of the SCSI drive carrier indicates drive activity. A connection to the SCSI SCA backplane enables this LED to blink on and off when that particular drive is being accessed.

- **Red:** A SAF-TE compliant backplane is needed to activate the red LED to indicate a drive failure. (A SAF-TE compliant SCSI backplane is optional on the 6010H.) If one of the SCSI drives fail, you should be notified by your system management software. Please refer to Section 6-4 for instructions on replacing failed SCSI drives.

3-5 Power Supply Switch

An on/off switch is located on the back of the power supply. This switch should normally be on at all times. Turning this switch to the off position removes both the main and standby power from the system, as opposed to the power button located on the control panel on the front of the chassis.

3-6 Motherboard LED

There is only one LED on the motherboard. When illuminated, it indicates that system power is present on the motherboard. This LED is located in the corner of the 370DER+ near the JA1 SCSI connector.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 6010H from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the motherboard, the MEC, memory modules and IDE and floppy drives. When disconnecting power, you should first power down the system with the operating system first and then unplug the power cords of all the power supply units in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- Motherboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery (located near the JA1 Ultra160 SCSI connector) is installed upside down, which will reverse its polarites. This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

4-2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the SuperServer 6010H clean and free of clutter.
- The SuperServer 6010H weighs approx. 26 lbs. (11.8 kg.) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.
- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.

- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

- Touch a grounded metal object before removing the board from the antistatic bag.

- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

- When handling chips or modules, avoid touching their pins.

- Put the motherboard and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Notes

Chapter 5

Advanced Motherboard Setup

This chapter covers the steps required to install the 370DER+ motherboard into the SC810 chassis, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are also described. A layout and quick reference chart are on pages 5-12 and 5-13. Remember to completely close the chassis when you have finished working with the motherboard to better cool and protect the system.

Tools Required

The only tools you will need to install the 370DER+ into the chassis are a long and a short Philips screwdriver.

5-1 Handling the 370DER+ Motherboard

Static electrical discharge can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). Also note that the size and weight of the 370DER+ motherboard can cause it to bend if handled improperly, which may result in damage. To prevent the 370DER+ motherboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from static discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its anti-static bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their anti-static bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Unpacking

The motherboard is shipped in antistatic packaging to avoid static electrical damage. When unpacking the board, make sure the person handling it is static protected.

5-2 Motherboard Installation

This section explains the first step of physically mounting the 370DER+ into the SC810 chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the motherboard, follow the procedure in reverse order.

1. **Accessing the inside of the 6010H (see Figure 2-5):**
   Two release buttons are located on the top cover of the chassis. Depressing both of these buttons while pushing the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server. (If already installed in a rack, you must first release the retention screws that secure the unit to the rack. Then grasp the two handles on either side and pull the unit straight out until the rails lock into place.)

2. **Check compatibility of motherboard ports and I/O shield:**
   The 370DER+ requires a chassis big enough to support a 12" x 10" motherboard, such as Supermicro's SC810 1U rackmount. Make sure that the I/O ports on the motherboard properly align with their respective holes in the I/O shield at the back of the chassis.

3. **Mounting the motherboard onto the motherboard tray:**
   Carefully mount the motherboard to the motherboard tray by aligning the board holes with the raised metal standoffs that are visible on the bottom of the chassis. Insert screws into all the mounting holes on your motherboard that line up with the standoffs and tighten until snug (if you screw them in too tight, you might strip the threads). Metal screws provide an electrical contact to the motherboard ground to provide a continuous ground for the system.

5-3 Connecting Cables

Now that the motherboard is installed, the next step is to connect the cables to the board. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-10 for connector locations.)

- IDE Device Cables (J13 and J14)
- Floppy Drive Cable (J15)
- SCSI Device Cables (JA1 and JA5)
- Control Panel Cable (JF1, see next page)

Connecting Power Cables

The 370DER+ has a 24-pin primary power supply connector designated "ATX Power" for connection to the ATX power supply. The ATX Power connector also is keyed to accept 20-pin power connectors if the power supply you are using has that type. See Section 5-8 for power connector pin definitions.

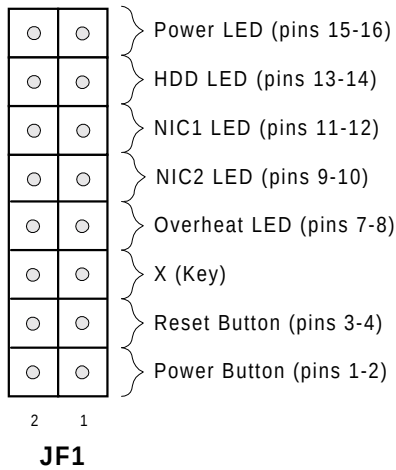
Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators. Please note that even and odd numbered pins are on opposite sides.

All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to JP4 of the Control Panel PCB board, located just behind the system status LEDs on the chassis. The control signals are all on the even numbered pins. See pages 5-12 to 5-14 for details and pin descriptions.

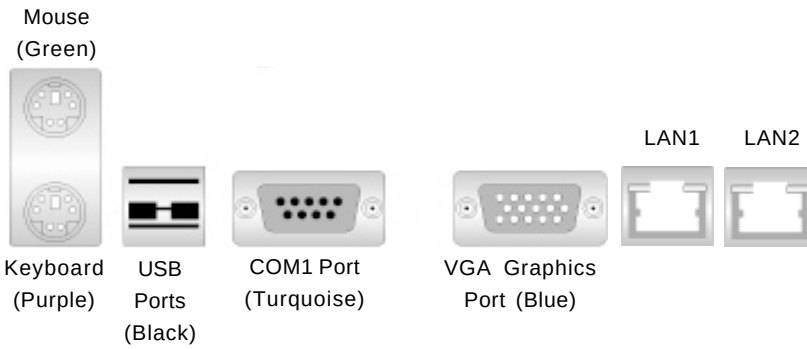
In addition to the 2-pin Power LED header on JF1, there is a 3-pin header for the same function at J215 on the motherboard, which is located near JF1.

Figure 5-1. Control Panel Header Pins



5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.



Note: The COM2 Port is a header on the motherboard, located near the Ultra160 SCSI channel B connector (JA3).

Figure 5-2. I/O Ports

5-5 Installing Processors

Avoid placing direct pressure to the top of the pro cessor package. Always connect the power cord last and always remove it before adding, removing or changing any hardware components.

1. Installing the FCPGA processors:

The 370DER+ has two 370-pin sockets, which support Intel FCPGA processors. Lift the lever on the FCPGA socket and insert the processor (with the heat sink attached) keeping the notched corner oriented toward pin one on the socket. Make sure the processor is fully seated in the socket and and then close the lever. You can also install a single processor on the motherboard without changing any jumper settings. (See Figure 5-4 for views of a 370-pin FCPGA socket before and after processor installation.)

2. Attaching heat sinks to the processors:

Two passive heat sinks (one for each processor) have been included with your SuperServer 6010H. Secure a heat sink to each processor with a suitable thermal compound to best conduct the heat from the processor to the heat sink. Make sure that you apply the compound evenly and that good contact is made between the CPU chip (the die) and the heat sink. Insufficient contact or inproper types of heat sinks and thermal compounds can cause the processor to overheat, which may crash the system.

4. Removing the processors:

To remove the processors from the motherboard, simply follow the installation process in reverse order.

Figure 5-3. FCPGA Socket: Empty and with Processor Installed

5-6 Installing Memory

CAUTION! Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. The MEC must be populated in the manner described in Step 2 below.

1. Memory support:

The 370DER+ supports 128/256/512 MB and 1 GB registered ECC SDRAM DIMMs. PC133 and PC100 memory are both supported at their respective speeds. However, the memory bus is synchronized to the front side bus speed meaning you cannot use PC100 with a 133 MHz FSB and using PC133 with a 100 MHz FSB will result in 100 MHz memory operation.

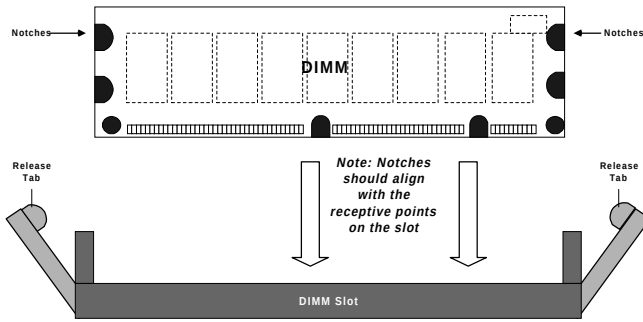
2. Interleaved memory:

The 370DER+ uses an interleaved memory scheme to improve performance. ***This requires that you install two modules at a time, meaning you must populate either both Bank0 slots or all four DIMM slots. In addition, both DIMMs installed in the same bank number (i.e. Bank0) must be the same brand, type, size and speed.***

3. Installing memory modules:

Insert each DIMM module vertically into its slot. Pay attention to the two notches along the bottom of the module to prevent inserting the DIMM module incorrectly. Gently press down on the DIMM module until it snaps into place in the slot (see Figure 5-4).

Figure 5-4. Side View of DIMM Installation into Slot



To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notches. To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

5-7 Adding PCI Cards

1. 64-bit PCI slot:

The 370DER+ has one 64-bit/66 MHz 3.3V PCI slot. Two riser cards designed specifically for using this slot in a 1U rackmount chassis are included with your system. These riser cards allow an installed PCI card to sit at a 90 degree angle so it can fit inside the chassis. One riser cards accommodates 64-bit, 66 MHz 3.3V PCI cards and the other is for 64 or 32-bit, 33 MHz 5V PCI cards. Figure 5-5 shows both riser cards.

2. PCI card installation:

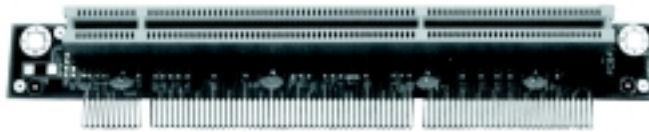
Before installing a PCI add-on card, make sure you choose the correct riser card for the type of PCI card you are installing (see step 1). Begin by removing the I/O shield for the PCI slot. Then fully seat the PCI card into the riser card and screw it into the metal retention rail (shown in Figure 2-5). Finally, insert the rider card into the PCI slot on the motherboard, pushing down with your thumbs evenly on both sides of the card. (See Figure 5-6 for location.) Finish by using a screw to secure the top of the card shield to the chassis. The I/O shield protects the motherboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering the slot.

3. Setting the jumper on the Riser Card:

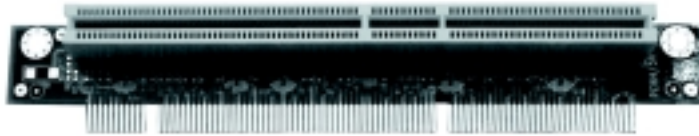
A jumper (JP1) on the 3.3V 64-bit 66/33 MHz Riser Card must be set according to the front side bus speed the processors are running at. If the processors are running at a 133 MHz FSB, this jumper should be off to enable 66 MHz PCI operation. A 100 MHz FSB requires the jumper to be on the two pins to enable the riser card to run at 33 MHz. If not set correctly, the system will experience problems.

Note: When changing the FSB (Front Side Bus) speed, you must also change the jumper that changes the chipset speed. Refer to Chapter 5 Section 10 for details on jumpers JP1 and JP63.

Figure 5-5. 3.3V and 5V Riser Cards



3.3V, 64-bit 66/33 MHz PCI



5V, 64-bit 33 MHz PCI

Figure 5-6. Adding PCI Cards

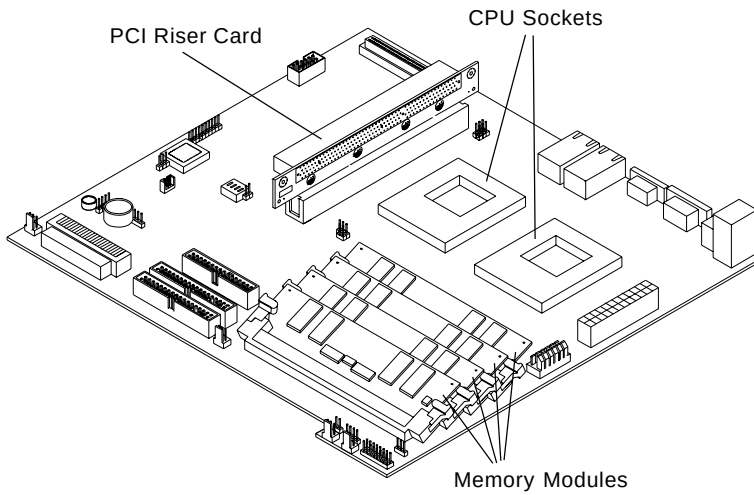
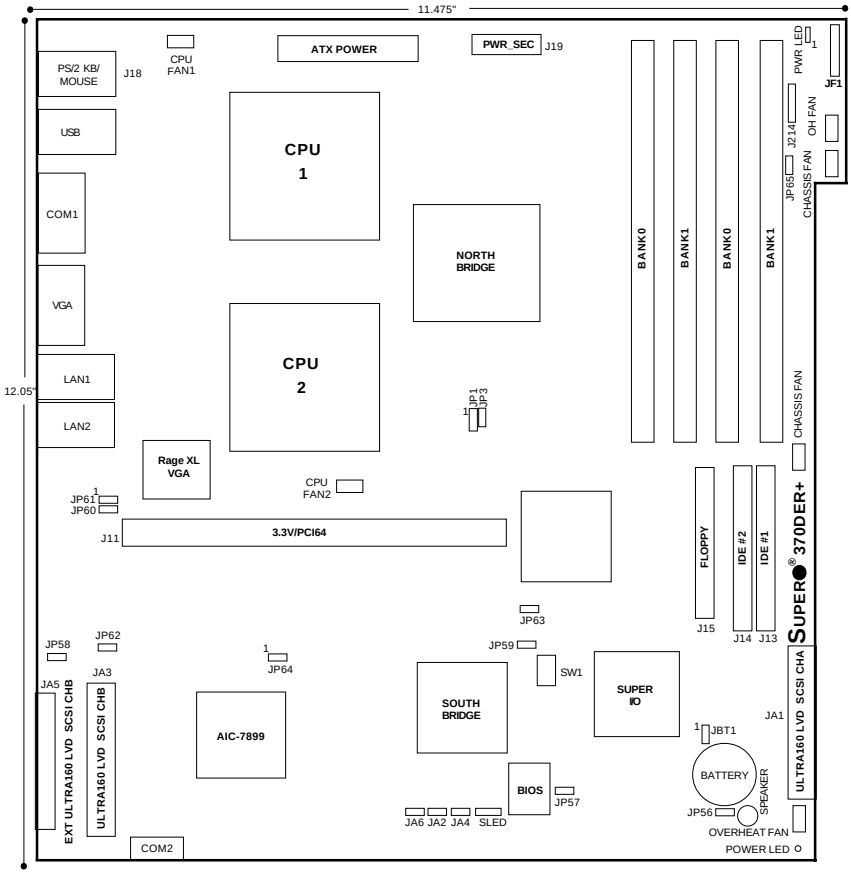


Figure 5-7. SUPER 370DER+ Layout
(not drawn to scale)



Also see the figure on page 5-4 for the Control Panel (JF1) connectors and page 5-5 for the locations of the I/O ports.

Jumpers not indicated are for test purposes only - you should not change the settings of these jumpers.

370DER+ Quick Reference

Jumpers	Description	Default Setting
JA2	LVD SCSI Ch A Term. (p. 5-19)	Open (Enabled)
JA4	LVD SCSI Ch B Term. (p. 5-19)	Open (Enabled)
JBT1	CMOS Clear (p. 5-19)	Pin 1-2 (Normal)
JP1	FSB Speed Setting (p. 5-18)	Open (133 MHz)
JP56	Speaker Enble/Disble (p. 5-19)	On (Enabled)
JP57	BIOS Select (p. 5-20)	Pin 1-2 (BIOS1)
JP58	LAN1 Enable/Disable (p. 5-20)	Off (Enabled)
JP60	VGA Enable/Disable (p. 5-20)	Pin 2-3 (Enabled)
JP61	VGA Interrupt Enable (p. 5-21)	Pin 2-3 (Enabled)
JP62	LAN2 Enable/Disable (p. 5-20)	Off (Enabled)
JP63	Chipset Speed Setting (p. 5-18)	Off (133 MHz)
JP64	SCSI Enable/Disable (p. 5-21)	Pin 1-2 (Enabled)

DIP Switch	Description	Default Setting
SW1 (1-4)	CPU Core/Bus Ratio	(see p. 5-17)

Connectors	Description
ATX POWER	Primary ATX Power Connector (p. 5-12)
BANK0/BANK1	Memory (RAM) Slots (p. 5-7)
COM1/COM2	COM1/2 Serial Port Conn/Header (p. 5-15)
CPU/CH/OH FAN	CPU/Chass./Overheat/ Fan Headers (p. 5-15)
J13, J14	IDE Hard Disk Drive Connectors (p. 5-22)
J15	Floppy Disk Drive Connector (p. 5-22)
J18	PS/2 Keyboard/Mouse (p. 5-16)
J214	USB0 Header (p. 5-14)
JA1	Ultra160 Channel A LVD SCSI (p. 5-23)
JA3	Ultra160 Channel B LVD SCSI (p. 5-23)
JA5	External U160 Channel B LVD SCSI (p. 5-23)
JF1	Control Panel Connector (p. 5-4)
LAN1/LAN2	Ethernet Port 1 / Ethernet Port 2 (p. 5-16)
PWR_SEC	Secondary ATX Power Connector (p. 5-12)
SLED1	SCSI LED header (p. 5-16)
USB	Universal Serial Bus Ports (p. 5-16)
VGA	Onboard VGA Monitor Connector

5-8 Connector Definitions

Power Supply Connectors

The primary power supply connector on the 370DER+ is designated as ATX POWER. This is a 24-pin connector, the same size as the connector from the power supply included with the 6010H. This connector will also accept 20-pin power connectors, which are used with some power supplies. See Table 5-1a for 24-pin connector pin definitions and 5-1b for 20-pin connector pin definitions.

Table 5-1a
ATX Power Supply 24-pin Connector
Pin Definitions (ATX POWER)

Pin Number	Definition	Pin Number	Definition
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	Ground	15	Ground
4	+5V	16	PS_ON#
5	Ground	17	Ground
6	+5V	18	Ground
7	Ground	19	Ground
8	PWR_OK	20	Res
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	Ground

Table 5-1b
ATX Power Supply 20-pin Connector
Pin Definitions (ATX PWR #1, ATX PWR #2)

Pin Number	Definition	Pin Number	Definition
1	+3.3V	11	3.3V
2	+3.3V	12	-12V
3	Ground	13	Ground
4	+5V	14	PS-ON
5	Ground	15	Ground
6	+5V	16	Ground
7	Ground	17	Ground
8	PW-OK	18	-5V
9	5VSB	19	+5V
10	+12V	20	+5V

Secondary Power Connector

If your power supply came equipped with a 20-pin connector, then you it should also have a 6-pin secondary power connector, which you should connect to the secondary power connector (PWR_SEC) on the motherboard. This connector is not needed when using a 24-pin connector to the ATX POWER connector. See Table 5-2 for pin definitions.

Table 5-2
Secondary Power Connector
(PWR_SEC)

Pin Number	Definition
1	Ground
2	Ground
3	Ground
4	+3.3V
5	+3.3V
6	+5V (keyed)

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. When illuminated, this LED indicates that power is applied to the system. There is also a 3-pin header for the Power LED located at J215. See Tables 5-3a and 3b for pin definitions and Figure 5-2 for pin locations.

Table 5-3a
Power LED
Pin Definitions
(JF1)

Pin Number	Definition
15	VCC 5V
16	Control Pin

Table 5-3b
Power LED
Pin Definitions
(J215)

Pin Number	Definition
1	VCC 5V
2	VCC 5V
3	Control

HDD LED

The Hard Disk Drive LED connection is located on pins 13 and 14 of JF1. This provides an indication of IDE disk activity on the control panel. See Table 5-4 for pin definitions and Figure 5-2 for pin locations.

Table 5-4
HDD LED Pin
Definitions
(JF1)

Pin Number	Definition
13	VCC 5V
14	Control Pin

NIC1 LED

The Network Interface Controller 1 LED connection is located on pins 11 and 12 of JF1. This header is used to display network activity on LAN (Ethernet) port 1. See Table 5-5 for pin definitions and Figure 5-2 for pin locations.

Table 5-5
NIC1 LED Pin
Definitions
(JF1)

Pin Number	Definition
11	3V Standby
12	Control Pin

NIC2 LED

The Network Interface Controller 2 LED connection is located on pins 9 and 10 of JF1. This header is used to display network activity on LAN (Ethernet) port 2. See Table 5-6 for pin definitions and Figure 5-2 for pin locations.

Table 5-6
NIC2 LED Pin
Definitions
(JF1)

Pin Number	Definition
9	3V Standby
10	Control Pin

Overheat LED

Pins 7 and 8 of JF1 are for the Overheat LED, which provides you with advanced warning of chassis overheating. This LED will also illuminate if the blower fan fails, which will cause the chassis temperature to rise. Refer to Table 5-7 for pin definitions and Figure 5-2 for pin locations.

Table 5-7
Overheat LED
Pin Definitions
(JF1)

Pin Number	Definition
7	VCC 5V
8	Control Pin

Reset

The Reset connection is located on pins 3 and 4 of JF1. This connector attaches to the Reset button on the control panel, which allows you to reboot the system. See Table 5-8 for pin definitions and Figure 5-2 for pin locations.

Table 5-8
Reset Button
Pin Definitions
(JF1)

Pin Number	Definition
3	Reset
4	Ground

PWR_ON

The PWR_ON connection is located on pins 11 and 13 of JF1. This connector attaches to the Power button on the control panel, which allows you to turn on and off the power to the system. The user can also configure this button to function as a suspend button. (See the Power Button Mode setting in BIOS.) To turn off the power when set to suspend mode, hold down the power button for at least 4 seconds. See Table 5-9 for pin definitions and Figure 5-2 for pin locations.

Table 5-9
PWR Button
Pin Definitions
(JF1)

Pin Number	Definition
1	PW_ON
2	Ground

Extra Universal Serial Bus Header (USB0)

An additional connection for USB0 is included at J214. You cannot have USB devices connected to both J214 and the chassis I/O connector. See Table 5-10 for pin definitions. You will need a USB cable (not included) for J214.

Table 5-10
USB0 Pin Definitions (J214)

Pin Number	Definition
25	+5V
27	PO-
29	PO+
31	Ground

Fan Headers*

There are several fan headers on the 370DER+ that provide cooling for various components. In addition to one fan header for each processor, there are two overheat and two chassis fan headers. When installed in the SC810 1U rackmount chassis, only the main blower fan is used. The blower fan should be connected to the chassis fan header located near the JF1 header. See the motherboard layout on page 5-10 for locations. Refer to Table 5-11 for pin definitions. **Note: The maximum current limitation for the onboard fans is 0.6 amps for each, not to exceed 1.25 amps for any two fans. I.e. both CPU fans, both chassis fans or both overheat fans.**

Table 5-11
Fan Header Pin Definitions (CPU, CHASSIS and OH FANs)

Pin Number	Definition
1	Ground (black)
2	+12V (red)
3	Tachometer

* Caution: These fan headers are DC power.

Serial Ports

Serial connector COM1 is located below the parallel port (see Figure 5-8). COM2 is a header located on the motherboard near the JA3 Ultra160 SCSI Channel B connector. See the motherboard layout on page 5-10 for locations. See Table 5-12 for pin definitions.

Table 5-12
Serial Port Pin Definitions (COM1, COM2)

Pin Number	Definition	Pin Number	Definition
1	DCD	6	CTS
2	DSR	7	DTR
3	Serial In	8	RI
4	RTS	9	Ground
5	Serial Out	10	NC

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on J18. See Table 5-13 for pin definitions. (The mouse port is above the keyboard port. See Figure 5-8.)

Table 5-13
PS/2 Keyboard and Mouse Port Pin Definitions (J18)

Pin Number	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Universal Serial Bus (USB)

Two Universal Serial Bus connectors are located on U25. USB0 is the bottom connector and USB1 is the top connector.

Note: USB0 is shared with pins 25, 27, 29 and 31 of JF1 (see page 5-17). Only one of these two connections may be used at one time.

USB0/USB1 Ports

LAN1/LAN2 Ports

Two Ethernet ports (designated LAN1 and LAN2) are located beside the VGA port on the I/O backplane. These ports accept RJ45 type cables. Two LEDs on each indicate a successful connection (yellow) and activity (green).

RJ45 Ethernet Port

SLED (SCSI LED) Indicator

The SLED connector is used to provide an LED indication of SCSI activity. Refer to Table 5-14 for connecting the SCSI LED.

Table 5-14
SLED (SCSI LED) Pin Definitions

Pin Number	Definition
1	Positive
2	Negative
3	Negative
4	Positive

5-9 DIP Switch Settings

DIP Switch 1: Core/Bus Ratio

A red DIP switch labeled SW1 is included on the 370DER+ motherboard. This DIP switch has four individual switches and is used to set the CPU core/bus ratio. The example on the right will show you which CPU core/bus ratio to use. After determining the ratio, refer to Table 5-17 for the correct settings of DIP switch 1.

Table 5-17
CPU Core/Bus Ratio Selection
(DIP Switch 1)

CPU Core/ Bus Ratio	SW1 #4	SW1 #3	SW1 #2	SW1 #1
4.0	ON	OFF	ON	ON
4.5	ON	OFF	ON	OFF
5.0	ON	OFF	OFF	ON
5.5	ON	OFF	OFF	OFF
6.0	OFF	ON	ON	ON
6.5	OFF	ON	ON	OFF
7.0	OFF	ON	OFF	ON
7.5	OFF	ON	OFF	OFF
8.0	OFF	OFF	ON	ON
8.5	OFF	OFF	ON	OFF
9.0	OFF	OFF	OFF	ON

Core/bus ratio = CPU speed / front side bus speed. Example: a 550 MHz CPU running at a 100 MHz FSB speed:

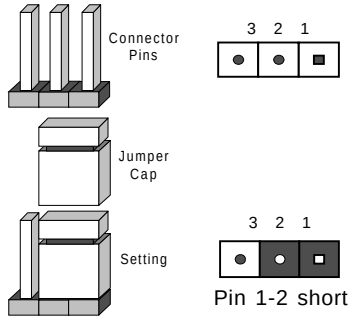
550 (MHz) / 100 (MHz) = 5.5 (ratio)

5-10 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

Note: Closed refers to the jumper being set over both pins on a two-pin jumper header. Open refers to the jumper being set over a single pin of a two-pin jumper.



Front Side Bus Speed

JP1 sets the FSB speed. CPU speed = FSB x Core/Bus ratio. Core/Bus Ratio settings are described in Section 5-8. See Table 5-18 for jumper settings. Changing the setting of this jumper must coincide with changing JP63 (below).

Table 5-18
Front Side Bus Speed
Jumper Settings (JP1)

Jumper Position	Definition
1-2	Auto
2-3	100 MHz
OFF	133 MHz

* Note: The Auto setting allows the CPU to set the speed.

Chipset Speed Setting

JP63 sets the chipset speed and is used in conjunction with JP1. This setting lets the chipset know what the FSB speed is, and so JP1 should not be set to Auto. The setting of JP1 and JP63 must be equal (both set to 133 MHz or both set to 100 MHz). See Table 5-19 for jumper settings.

Table 5-19
Chipset Speed Setting
Jumper Settings (JP63)

Jumper Position	Definition
Open	133 MHz
Closed	100 MHz

LVD Channel A SCSI Termination Enable/ Disable

Jumper JA2 allows you to enable or disable termination for the LVD Channel A SCSI connector. The normal (default) position is open to enable SCSI termination. See Table 5-20 for jumper settings.

Table 5-21
LVD CH A SCSI Termination
Jumper Settings (JA2)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

LVD Channel B SCSI Termination Enable/ Disable

Jumper JA4 allows you to enable or disable termination for the LVD Channel B SCSI connector. The normal (default) position is open to enable SCSI termination. See Table 5-21 for jumper settings.

Table 5-21
LVD CH B SCSI Termination
Jumper Settings (JA4)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

CMOS Clear

Refer to Table 5-22 for setting JBT1 to clear CMOS. Always remove the AC power cord from the system before clearing CMOS.

Table 5-22
CMOS Clear Jumper Settings (JBT1)

Jumper Position	Definition
1-2	Normal
2-3	CMOS Clear

Speaker Enable/Disable

Jumper JP56 allows you to enable or diable the onboard speaker. Refer to Table 5-23 for jumper settings.

Table 5-23
Speaker Enable/Disable
Jumper Settings (JP56)

Jumper Position	Definition
Open	Disabled
Closed	Enabled

BIOS Select

The 370DER+ has two BIOS sockets. If you have a BIOS chip installed in each, you can use the second as a backup if the primary BIOS chip becomes corrupted. (Switching from one BIOS chip to the other must be done manually.) The setting of jumper JP57 determines which of the two BIOS chips will be used. The Primary BIOS chip is the default setting. See Table 5-24 for jumper settings.

Table 5-24
BIOS Select
Jumper Settings (JP57)

Jumper Position	Definition
1-2	Primary BIOS
2-3	Secondary BIOS

LAN 1 Enable/Disable

Use jumper JP58 to enable or disable the onboard LAN 1 (Ethernet) port. The default setting is enabled. See Table 5-25 for jumper settings.

Table 5-25
LAN 1 Enable/Disable
Jumper Settings (JP58)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

LAN 2 Enable/Disable

Use jumper JP62 to enable or disable the onboard LAN 2 (Ethernet) port. The default setting is enabled. See Table 5-26 for jumper settings.

Table 5-26
LAN 2 Enable/Disable
Jumper Settings (JP62)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

VGA Enable/Disable

Use jumper JP60 to enable or disable the onboard Rage XL AGP controller. The default setting is enabled. See Table 5-27 for jumper settings.

Table 5-27
VGA Enable/Disable
Jumper Settings (JP60)

Jumper Position	Definition
1-2	Disabled
2-3	Enabled

VGA Interrupt Enable/ Disable

Use jumper JP61 to enable or disable the use of an interrupt for he onboard VGA. The default setting is enabled. See Table 5-28 for jumper settings.

Table 5-28
VGA Interrupt Enable/ Disable
Jumper Settings (JP61)

Jumper Position	Definition
1-2	Disabled
2-3	Enabled

SCSI Enable/Disable

Jumper JP64 allows you to enable or disable all onboard SCSI. The normal (default) position is open to enable SCSI operation. See Table 5-29 for jumper settings.

Table 5-29
SCSI Enable/Disable
Jumper Settings (JP64)

Jumper Position	Definition
Pin 1-2	Enabled
Pin 2-3	Disabled

5-11 Floppy/Hard Disk and SCSI Connections

Be aware of the following when connecting the floppy and hard disk drive cables:

- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with the twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

Floppy Connector

The floppy connector is located on J15 and requires a 34-pin ribbon cable for operation. See Table 5-30 for pin definitions.

Table 5-30
Floppy Connector Pin Definitions (J15)

Pin Number	Function	Pin Number	Function
1	GND	2	FDHDIN
3	GND	4	Reserved
5	Key	6	FDEDIN
7	GND	8	Index-
9	GND	10	Motor Enable
11	GND	12	Drive Select B-
13	GND	14	Drive Select A-
15	GND	16	Motor Enable
17	GND	18	DIR-
19	GND	20	STEP-
21	GND	22	Write Data-
23	GND	24	Write Gate-
25	GND	26	Track 00-
27	GND	28	Write Protect-
29	GND	30	Read Data-
31	GND	32	Side 1 Select-
33	GND	34	Diskette

Table 5-31
IDE Connector Pin Definitions
(J13, J14)

Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	Key
21	DRQ3	22	GND
23	I/O Write-	24	GND
25	I/O Read-	26	GND
27	IOCHRDY	28	BALE
29	DACK3-	30	GND
31	IRQ14	32	IOCS16-
33	Addr 1	34	GND
35	Addr 0	36	Addr 2
37	Chip Select 0	38	Chip Select 1-
39	Activity	40	GND

IDE Connectors

There are no jumpers to configure the onboard IDE connectors J13 and J14. Refer to Table 5-31 for pin definitions.

Ultra160 SCSI Connectors

Refer to Table 5-32 for pin definitions for the Ultra160 SCSI connectors located at JA1, JA3 and JA5.

Table 5-32
68-pin Ultra160 SCSI Connectors (JA1, JA3, JA5)

Connector Contact Number	Signal Names	Connector Contact Number	Signal Names
1	+DB(12)	35	-DB(12)
2	+DB(13)	36	-DB(13)
3	+DB(14)	37	-DB(14)
4	+DB(15)	38	-DB(15)
5	+DB(P1)	39	-DB(P1)
6	+DB(0)	40	-DB(0)
7	+DB(1)	41	-DB(1)
8	+DB(2)	42	-DB(2)
9	+DB(3)	43	-DB(3)
10	+DB(4)	44	-DB(4)
11	+DB(5)	45	-DB(5)
12	+DB(6)	46	-DB(6)
13	+DB(7)	47	-DB(7)
14	+DB(P)	48	-DB(P)
15	GROUND	49	GROUND
16	DIFFSENS	50	GROUND
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	RESERVED	53	RESERVED
20	GROUND	54	GROUND
21	+ATN	55	-ATN
22	GROUND	56	GROUND
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MSG
27	+SEL	61	-SEL
28	+C/D	62	-C/D
29	+REQ	63	-REQ
30	+I/O	64	-I/O
31	+DB(8)	65	-DB(8)
32	+DB(9)	66	-DB(9)
33	+DB(10)	67	-DB(10)
34	+DB(11)	68	-DB(11)

5-12 IRQs

Some PCI bus mastering devices share IRQs (Interrupt Requests) without performance penalties. See Table 5-33 for details on shared IRQs.

Table 5-33. IRQs

The PCI slot (J11) has a dedicated IRQ.
The onboard LAN1 has a dedicated IRQ.
The onboard LAN2 has a dedicated IRQ.
The onboard SCSI has a dedicated IRQ.
The onboard graphics has a dedicated IRQ.

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC810 chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

Tools Required

The only tool you will need to install components and perform maintainance is a Philips screwdriver.

6-1 Static-Sensitive Devices

Electric Static Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

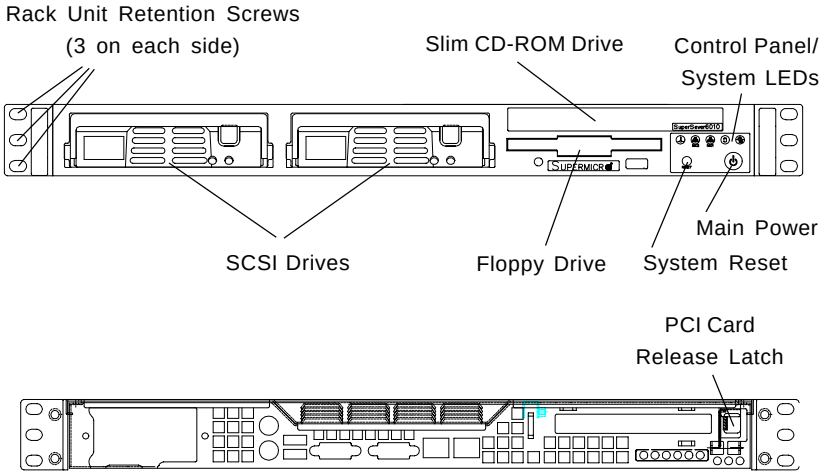


Figure 6-1. Chassis Front and Rear Views

6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the motherboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the motherboard to JP4 on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both JF1 and JP4. Pull all excess cabling out of the airflow path. The LEDs inform you of system status. See Chapter 3: System Interface for details on the LEDs and the control panel buttons. Details on JF1 can be found in the Chapter 5: Advanced Motherboard Installation.

6-3 System Fans

One 10-cm blower fan provides all the cooling needed for the SuperServer 6010H. An optional 4-cm fan can also be installed into the chassis cross section just above the ribbon cable to the JA1 SCSI connector on the motherboard. The chassis includes air seals under the blower fan and at the chassis cross section, which separates the drive bay area from the motherboard area of the chassis to promote better airflow. It is highly important that the air seal is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis. See Figure 6-3.

System Fan Failure

The blower fan runs at a full 100% rpm. If the fan fails, the ambient air temperature in the chassis will rise and activate the overheat LED on the control panel. You will need to power down the system to replace this fan.

Replacing System Cooling Fans

1. Removing the blower fan:

After turning off the power to the system, first remove the chassis cover and unplug the fan cable from the motherboard. Lift the blower fan from the mounting posts and pull it completely out from the motherboard. See Figure 6-3.

2. Installing a new blower fan:

Replace the failed fan with an identical 10-cm, 12 volt fan (available from Supermicro). Position the new fan at its proper place in the chassis, by fitting the fan onto the fan mounting posts in the chassis. After the new fan has been installed, plug the fan cable back into the same chassis fan header on the motherboard you removed it from. Make sure the air seal under the fan is properly installed and creating a good seal. Power up the system and check that the fan is working properly and that the LED on the control panel has turned off. Finish by replacing the top panel of the chassis.

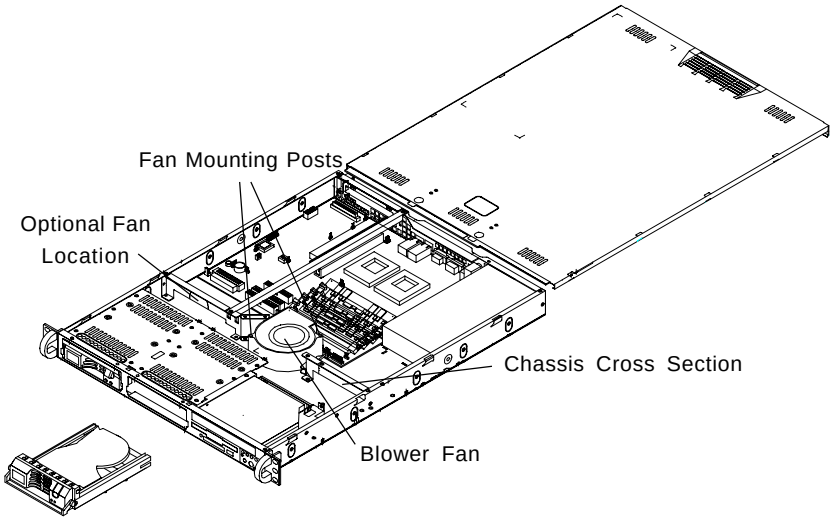


Figure 6-3. System Cooling Fans

6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

SCSI Drives: You do not need to access the inside of the chassis to replace or swap SCSI drives. Proceed to the next step for instructions. **Note: You must use standard 1" high, 80-pin SCA SCSI drives in the SuperServer 6010.**

CD-ROM/Floppy Disk Drive: For installing/removing the CD-ROM or floppy disk drive, you will need to gain access to the inside of the 6010 by removing the top cover of the chassis. Proceed to the "CD-ROM and Floppy Drive Installation" section later in this chapter for instructions. **Note: Only a "slim" CD-ROM drive will fit in the 6010.**

SCSI Drive Installation

1. Mounting a SCSI drive in a drive carrier:

The SCSI drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the SCSI drive bays. For this reason, even empty carriers without SCSI drives installed must remain in the chassis. To add a new SCSI drive, install a drive into the carrier with the printed circuit board side toward the carrier so that the mounting holes align with those in the carrier. Secure the drive to the carrier with four screws, as shown in Figure 6-4.

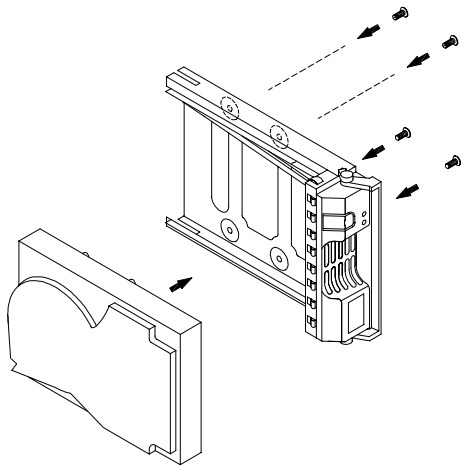


Figure 6-4. Mounting a SCSI Drive in a Carrier

Use caution when working around the SCSI backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.

Important: Regardless of how many SCSI hard drives are installed, both SCSI drive carriers must remain in the drive bays for proper airflow.

2. Installing/removing hot-swap SCSI drives:

Two SCSI drive bays are located in the front of the chassis, making them easily accesible for installation and removal. These SCSI drives are hot-swap units, meaning they can be installed and removed without powering down the system. To remove, first push the release button located beside the drive LEDs, then swing the burgundy colored handle fully out and use it to pull the unit straight out (see Figure 6-5).

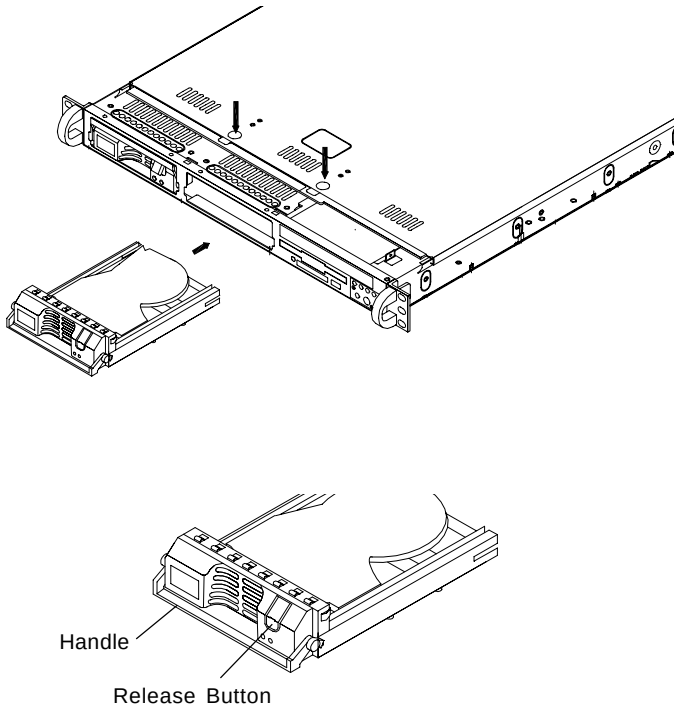


Figure 6-5. Removing SCSI Drives

<u>Important:</u> Regardless of how many SCSI hard drives are installed, both SCSI drive carriers must remain in the drive bays to maintain proper airflow.

SCSI Power Cables

SCSI power cables should be routed so that they do not block the airflow through the chassis. There is a 4-pin connector for the power cables.

SCA Backplane

The SCSI drives plug into an SCA backplane that provides power, SCSI ID and bus termination. A RAID controller can be used with the SCA backplane to provide data security. The operating system you use must have RAID support to enable the hot-swap capability of the SCSI drives. The SCA SCSI backplane is already preconfigured, so there are no jumpers or switches present on it.

CD-ROM and Floppy Drive Installation

The top cover of the chassis must be opened to gain full access to the CD-ROM and floppy drive bays. The CD-ROM drive must have a "slim" profile to fit into the 6010H.

First, release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server. You must power down the system before installing or removing floppy or IDE drives.

Drives mount on rails and should "click" into place to be correctly and fully installed in their bays.

- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

6-5 Power Supply

The SuperServer 6010H has a single 250 watt power supply. This power supply has an auto-switching capability, which enables it to automatically sense and operate with either 110 or 220 volt inputs. A power on/off switch is located at the back of the power supply. Turning this power switch to the off position will remove both main and standby power from the system.

Power Supply Failure

If the power supply unit fails, the system will shut down and you will need to replace the power supply unit. Replcaement units can be ordered directly from Supermicro. See contact infomation in the Preface.

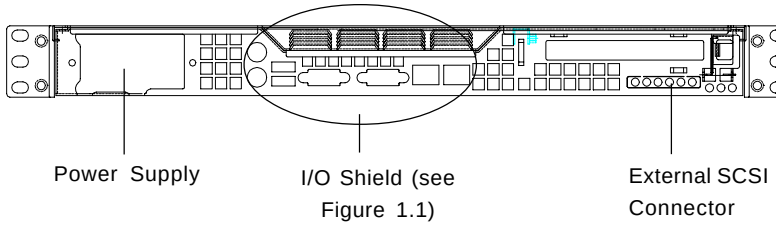
Replacing the Power Supply

1. Accessing the inside of the SuperServer 6010:
To replace a power supply, you must first remove the top chassis cover. To do so, first release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and push it away from you. You can then lift the top cover from the chassis to gain full access to the inside of the server.

2. Removing the power supply: (See Figure 6-6)
First unplug the power cord from the system. To remove the failed power unit, remove the two screws on the back of the power supply, which secure it to the chassis. You can then lift the unit straight out of the chassis. (The power cord should have already been removed.)

3. Installing a new power supply:
Replace the failed unit with another unit of the same wattage. It is highly recommended to replace it with the exact same power supply. Carefully insert the new unit into position in the chassis and secure it with the two screws at the rear of the unit. Before reconnecting the power cord, make sure the power switch on the power supply is in the off position. Then reconnect the power cord, replace the chassis top cover and push the unit back into the rack. Finish by turning the power switch on the power supply on, and then depress the power button on the front of the system.

Figure 6-6. Chassis Rear View



Notes

Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMIBIOS Setup Utility that is used in the SuperServer6010H. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Refer to the Manual Download area of our web site for newer BIOS revisions that may have changes that are not reflected in this manual.

System BIOS

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The BIOS ROM stores the system parameters, such as amount of memory, type of disk drives and video displays, etc. BIOS ROM requires very little power. When the computer is turned off, a back-up battery provides power to the BIOS ROM, enabling it to retain the system parameters. Each time the computer is powered-on, the computer is then configured with the values stored in the BIOS ROM by the system BIOS, which gains control when the computer is powered on.

How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Chipset and Power menus. Section 4-3 gives detailed descriptions of each parameter setting in the Setup utility.

An AMIBIOS identification string is displayed at the left bottom corner of the screen, below the copyright message.

7-2 BIOS Features

- Supports Plug and Play v1.0A
- Supports Intel PCI (Peripheral Component Interconnect) (PME) local bus specification v2.2
- Supports Advanced Power Management (APM) specification v1.1
- Supports ACPI
- Supports Flash ROM
- Supports BBS (Boot BIOS Specifications), which describes a method to organize IPL (Initial Program Load) devices, sets the boot order according to user preference, and allows booting from different types of media.

AMIBIOS supports the LS120 drive made by Matsushita-Kotobuki Electronics Industries Ltd., which can be used as a boot device and is accessible as the next available floppy drive.

AMIBIOS supports PC Health Monitoring chips. When a failure occurs in a monitored activity, AMIBIOS can sound an alarm and display a message. PC Health Monitoring chips monitor:

- CPU temperature
- Additional temperature sensors
- Chassis intrusion detector
- Five positive and two negative voltage inputs
- Three fan speed monitor inputs

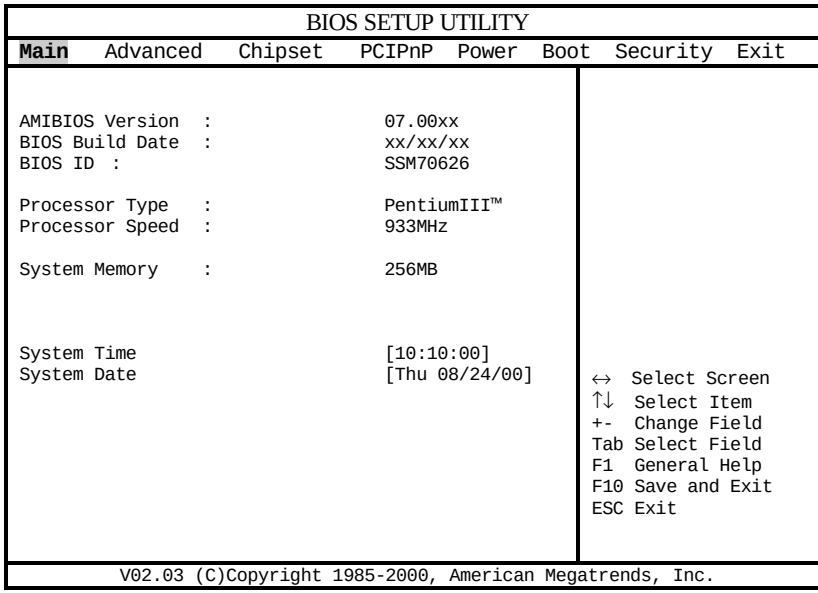
7-3 Running Setup

Optimal default settings are in bold text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the Standard Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see on next page).

The Main BIOS Setup Menu

Press the <Delete> key during the POST (Power On Self Test) to enter the Main Menu of the BIOS Setup Utility. All Main Setup options are described in this section. The Main BIOS Setup screeen is displayed below.



Use the Up/Down arrow keys or the <Tab> key to move between the different settings in the above menu.

When the items "System Time", and "System Date" are highlighted, type in the correct time/date in the time field, and then press "Enter". The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format. The time is in also 24-hour format. For example, 5:30 a.m. appears as 05:30:00 and 5:30 p.m. as 17:30:00.

Press the <ESC> key to exit the Main Menu and use the Left/Right arrow keys to enter the the other categories of BIOS settings. The next section is described in detail to illustrate how to navigate through the menus.

***Note: Items displayed in gray are preset and cannot be selected. Items with a blue arrow are commands, not options (i.e. Discard Changes).**

7-4 Advanced BIOS Setup

Choose Advanced BIOS Setup from the AMIBIOS Setup Utility main menu with the Left/Right arrow keys. You should see the following display. Select one of the items in the left frame of the screen, such as SuperIO Configuration, to go to the sub screen for that item. Advanced BIOS Setup options are displayed by highlighting the option using the arrow keys. All Advanced BIOS Setup options are described in this section.

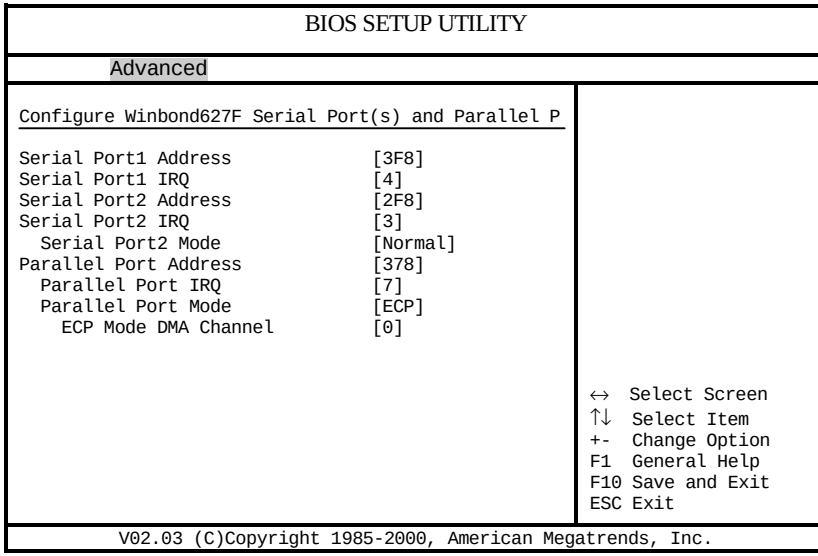
```
                        BIOS SETUP UTILITY
Main  Advanced  Chipset  PCIPnP  Power  Boot  Security  Exit

Setup Warning                                  Configure SuperIO
Setting items on this screen to incorrect values Chipset Winbond627F
may cause the system to malfunction!

> SuperIO Configuration
> IDE Configuration
> Floppy Configuration
> Boot Settings Configuration
> Event Log Configuration
> Peripheral Device Configuration
> System Health Monitor

                                               ↔  Select Screen
                                               ↑↓  Select Item
                                               Enter Go to Sub  Screen
                                               F1  General Help
                                               F10 Save and Exit ESC
                                               Exit

          V02.03 (C)Copyright 1985-2000, American Megatrends, Inc.
```

Use the Up/Down arrow keys to select the "Super I/O Configuration line.

When the "Super IO Configuration" line is highlighted, hit "ENTER" to display its menu.

The following Super IO Configuration screen will appear. Here you can select your options for the your computer's I/O (Input/Output) devices.

Super IO Configuration



The Super IO Configuration includes the following items:

Serial Port 1 Address

This option specifies the base I/O port address of serial port 1. The settings for this item include Disabled, **3F8** and 3E8 and 2E8. Select the desired setting and then press "Enter".

Serial Port 1 IRQ

This option specifies the Interrupt Request address of serial port 1. The settings for this item include Disabled, **4** and 3.

Serial Port 2 Address

This option specifies the base I/O port address of serial port 2. The settings for this item include Disabled, **2F8**, 3E8 and 2E8.

Serial Port 2 IRQ

This option specifies the Interrupt Request address of serial port 2. The settings for this item include Disabled, 4 and **3**.

IDE Configuration

Onboard PCI IDE Controller

This option allows the user to enable or disable the integrated IDE Controller. The settings include Disabled, Primary, Second and **Both**. Select "Disabled" to disable the Integrated IDE Controller. Select "Primary" to enable the Primary IDE ontroller only. Select "Secondary" to enable the Secondary IDE Controller only. Select "Both" to enable both Primary and Secondary IDE Controllers.

Primary IDE Master

When entering "Setup", BIOS automatically detects the presence of IDE devices. This displays the auto detection status of the IDE de vices. You can also manually configure the IDE drives by providing the following information:

This option allows the user to configure the IDE devices. When the desired item is highlighted (selected), press "Enter" and the following screen will be displayed:

Type

This option sets the type of device that the AMIBIOS attempts to boot from after AMIBIOS POST is completed. The settings include Not installed, **Auto**, CDROM and ARMD. The "Auto" setting allows BIOS to automatically detect the presence of the IDE controller.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In LBA mode, the maximum drive capac ity is 137 GB. The settings are Disabled and **Auto**. Select "Disabled" to disable LBA mode. Select "Auto" to enable LBA mode if your device supports it and is not already formatted with the LBA mode.

Block (Multi-Sector Transfer) Mode

This option sets the block mode multi sector transfers option The settings include Disabled and **Auto**. Disabled: This op-

tion prevents the BIOS from using Multi-Sector Transfer on the specified channel. The data to and from the device will occur one sector at a time.Auto: This option allows the BIOS to auto detect device support for Multi-Sector Transfers on the specified channel. If supported, this option allows the BIOS to auto detect the number of sectors per block for transfer from the hard disk drive to memory. The data transfer to and from the device will occur multiple sectors at a time (if the device supports it).

PIO Mode

IDE PIO (Programmable I/O) mode programs timing cycles be tween the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The settings are: **Auto**, 1, 2, 3 and 4.

DMA Mode

This item allows the users to select the DMA mode. The settings are: **Auto**, SWDMA0, SWDMA1, SWDMA2, MWDMA0, MWDMA1, MWDM2, UWDMA0, UWDMA1, UWDMA2, UWDMA3 and UWDMA4. Select Auto to auto detect the DMA Mode. Select SWDMA0 through SWDMA2 to set single word DMA0 through DMA2. Select MWDMA0 through MWDMA2 to set Multi-word DMA0 through DMA2. Select UDMA0 trhough UDMA4 to set Ultra DMA0 through Ultra DMA4.

S.M.A.R.T.

S.M.A.R.T stands for Self-Monitoring Analysis and Reporting Technology, a feature that can help predict impending drive failures. The settings are **Auto**, Disabled and Enabled. Select "Enabled" or "Disabled" to enable or disable the S.M.A.R.T. Select "Auto" to auto detect S.M.A.R.T.

32Bit Data Transfer

The settings are **Auto**, Disabled and Enabled. Select "Enabled" or "Disabled" to enable or disable the 32-bit Data Transfer function. Select "Auto" to auto detect the 32-bit Data Transfer function.

ARMD Emulation Type

This option is used to select the emulation used when config uring an LS120, MO (Magneto-Optical), or Iomega Zip drive. The settings are **Auto**, Floppy and HardDisk.

Primary IDE Slave

When the system enters "Setup", BIOS automatically detects the presence of IDE devices. This option displays the auto detection status of IDE devices. The settings for "Primary IDE Slave" are the same as those for the "Primary IDE Master".

Secondary IDE Master

This displays the status of auto detection of IDE devices. The settings for "Secondary IDE Master" are the same as those for the "Primary IDE Master".

Secondary IDE Slave

This displays the status of auto detection of IDE devices. The settings for "Secondary IDE Slave" are the same as those for the "Primary IDE Master".

Hard Disk Write Protect

This item allows the user to prevent the hard disk from being overwritten. The options are Enabled or **Disabled**. Enabled allows the drive to be used normally; read, write and erase functions can all be performed. Disabled prevents the hard disk from being erased. This function is effective only when the device can be accessed through BIOS.

ATA(PI) Detect Timeout

Set this option to stop the system search for ATAPI devices within the specified number of seconds. The options are 0, 5, 10, 15, 20, 25, 30, and **35** (seconds). Most ATA disk drives can be detected within 5 seconds.

ATA(PI) 80Pin Cable Detection

This option selects the mechanism for detecting the 80-pin ATA(PI) cable. Options include **Host and Device**, Host, and Device. Host: This option uses the motherboard onboard IDE controller to detect the type of IDE cable

used. Device This option uses the IDE disk drive to detect the type of IDE cable used. Host & Device: This option uses both the motherboard onboard IDE controller and IDE disk drive to detect the type of IDE cable used.

Floppy Configuration

Floppy A

Use this option to specify which of floppy drive you have installed in the A drive. The settings are Disabled, 360 KB 5 1/4", 1.2 MB 5 1/4", 720 KB 3 1/2", **1.44 MB 3 1/2"** and 2.88 MB 3 1/2".

Floppy B

Use this option to specify which of floppy drive you have installed in the B drive. The settings are Disabled, 360 KB 5 1/4", 1.2 MB 5 1/4", 720 KB 3 1/2", **1.44 MB 3 1/2"** and 2.88 MB 3 1/2".

Diskette Write Protect

This option allows you to prevent any writing to your floppy diskette. The settings are Enabled and **Disabled**. The Enabled setting is effective only if the device is accessed through BIOS.

Floppy Drive Seek

Use this option to Enable or **Disable** the floppy seek routine on bootup.

Boot Settings Configuration

Quick Boot

This option allows the BIOS to skip certain tests that are normally perfomred on boot up. You can disable the option to speed up boot time. The settings are **Disabled** and Enabled.

Quiet Boot

If Disabled, this option will cause the normal POST messages to be displayed upon setup. When **Enabled**, the OEM logo is displayed instead of the POST messages.

Add-On ROM Display Mode

Set this option to display add-on ROM (read-only memory) messages. The settings for this option are **Force BIOS** and Keep Current. Force BIOS allows the computer to force a third party BIOS to display during system boot. Keep Current has the system display AMIBIOS information on bootup.

BootUp Num Lock

This option is used to select the status of the Number Lock function on your keyboard on bootup. The settings are **On** and Off.

BootUp CPU Speed

This option is used set the CPU speed to either **High** or Low.

PS/2 Mouse Support

This option specifies whether a PS/2 Mouse will be supported. Settings are **Enabled** and Disabled.

Typematic Rate

Set this option to select the rate at which the computer repeats a key that is held down. Settings are **Fast** and Slow. Fast: This sets the rate the computer repeats a key to over 20 times per second. Under normal operations, this setting should not be changed. Slow: This sets the rate the computer repeats a key to under 8 times per second.

System Keyboard

This option is to let the system know if a keyboard is **Present** or Absent.

Primary Display

This option specifies the type of monitor display you have installed on the system. The settings are Absent, **VGA/EGA**, Color 40 x 25, Color 80 x 25 and monochrome.

Parity Check

Use this option to either Enable or **Disable** the use of memory parity checking.

Boot to OS/2

This option can be used to boot the system to an OS/2 operating system. The settings are **No** and Yes.

Wait for F1 if Error

This settings for this option are **Enabled** and Disabled. Disabled: This prevents the AMIBIOS to wait on an error for user intervention. This setting should be used if there is a known reason for a BIOS error to appear. An example would be a system administrator must remote boot the system. The computer system does not have a keyboard currently attached. If this setting is set, the system will continue to bootup in to the operating system. If 'F1' is enabled, the system will wait until the BIOS setup is entered. Enabled: This option allows the system BIOS to wait for any error. If an error is detected, pressing <F1> will enter Setup and the BIOS setting can be adjusted to fix the problem. This normally happens when upgrading the hardware and not setting the BIOS to recognize it.

Hit "Delete" Message Display

This option tells the system to display or not display the "Hit Delete to Enter Setup" message. The settings are **Enabled** and Disabled.

Internal Cache

This option is for enabling or disabling the internal CPU L1 cache. Settings include Disabled, Write-Thru and **Write-Back**. Disabled: This option prevents the system from using the internal CPU L1 cache. This setting should be used to slow the computer system down or to troubleshoot error messages. Write-Thru: This option allows the computer system to use the internal CPU L1 cache as Write-Though cache. Write-Through cache is slower than Write-Back cache. It performs write operations to the internal L1 CPU cache and system memory simultaneously.Write-Back This option allows the computer system to use the internal CPU L1 cache as Write-Back cache. Write-Back cache is faster than Write-Through cache. Write-Back cache is a caching method in which modifications to data in the cache aren't copied to the cache source until absolutely necessary. Write-back caching is available on all CPUs supported by this BIOS. With these CPUs, write operations stored in the L1 cache aren't copied to main memory until absolutely necessary. This is the default setting.

System BIOS Cacheable

This option enables you to move the system BIOS to the memory cache to improve performance. Settings are **Enabled** and Disabled.

Event Log Configuration

Event Logging

This option **Enables** or Disables the logging of events. You can use this screen to select options for the Event Log Configuration Settings. You can access sub screens to view the event log and mark all events as read. Use the up and down arrow keys to select an item, and the plus (+) and minus (-) keys to change the option setting. The settings are described on the following pages. The screen is shown below.

ECC Event Logging

This option Enables or **Disables** the logging of ECC events. The events logged by AMIBIOS are post errors such as a bad BIOS, floppy errors, or hard drive errors.

Clear All Event Logs

This option can be used to tell the system to clear the event log on the next boot up. The settings are **No** and Yes.

View Event Log

Highlighting this and pressing <Enter> will allow you to view the unread events from the event log area.

View All Events As Read

Highlighting this and pressing <Enter> will mark all events in the log area as having already been read.

Peripheral Device Configuration

Onboard SCSI

This option allows you to Enable the onboard SCSI. The settings are **Enabled** and Disabled.

Power Lost Control

This option determines how the system will respond when power is reapplied after a power loss condition. **Always On** means the system will automatically start up when power is reapplied. Always Off means you must push the main power button to restart the system after power is restored.

System Health Monitor

The BIOS continuously monitors the health of your system by measuring certain voltage levels and temperatures.

System Overheat Warning

This option allows you to **Enable** or Disable a system overheat warning signal, used to notify you in the event of a dangerous rise in heat levels.

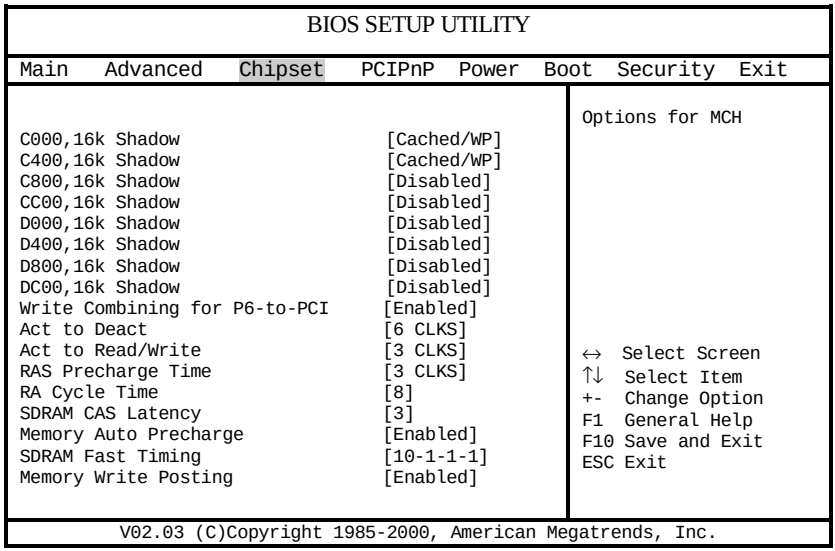
Overheat Warning Temperature

This option allows you to specify the temperature threshold that, when exceeded, will trigger the overheat warning alarm.

The rest of the Health Monitor menu lists various voltages and temperatures as they are currently being measured. These include CPU temperature, CPU voltage, the rpms of the CPU, chassis and thermal control fans as well as the primary voltage levels used by the system: +3.3V, +5V, +12V and -12V.

7-5 Chipset Setup

Choose Chipset Setup from the AMIBIOS Setup Utility main menu. The screen is shown below. All Chipset Setup options are described following the screen. You can use this screen to select options for the GHCH Configuration.



C000, 16k Shadow

C400, 16k Shadow

C800, 16k Shadow

CC00, 16k Shadow

D000, 16k Shadow

D400, 16k Shadow

D800, 16k Shadow

Write Combining for P6-to-PCI

The settings for this option are **Enabled** and Disabled.

DC00, 16k Shadow

These options specify how the 16 KB of video ROM at each of the above addresses is treated. When Disabled, the contents of the video ROM are not copied to RAM. When Enabled, the contents of 16 KB of video ROM beginning at the above address are copied (shadowed) from ROM to RAM for faster application. When set to Cached/WP, the contents of 16 KB of video ROM beginning at the above address are copied (shadowed) from ROM to RAM and can be written to or read from cache memory. The settings for this option are Disabled, Enabled and Cached/WP. (The optimal settings are Cached/WP for C000 and C400 and Disabled for all the other settings.

Act to Deact

The settings for this option are **6 CLKS** and 5 CLKS.

Act to Read/Write

The settings for this option are **3 CLKS** and 2 CLKS.

RAS Precharge Time

The precharge time is the number of cycles it takes for the RAS to accumulate a charge before a DRAM refresh. Insufficient recharge time may cause the DRAM to lose data. The settings are **3 CLKS** (which is more stable) and 2 CLKS. RAS stands for Row Address Strobe.

RAS Cycle Time

This option defines the RAS cycle time. Settings include 10 CLKS, **9 CLKS,** 8 CLKS and 7 CLKS.

SDRAM CAS Latency

This settings for this option are **CAS Latency 3** and CAS Latency 2. CAS stands for Column Address Strobe.

Memory Auto Precharge

The settings for this option are **Enabled** and Disabled.

SDRAM Fast Timing

The settings for this option are 11-1-1-1 and **10-1-1-1**.

Memory Write Posting

The settings for this option are **Enabled** and Disabled.

Fast ECC Enable

The settings for this option are Enabled and **Disabled**.

ISA IO Cycle Delay

The settings for this option are Full Delay, **1.5 BCLK,** 2.5 BLCK and 3.5 BLCK.

Scrubbing Enable

The settings for this option are Enabled and **Disabled**.

AGP Device Address Space Size

The settings for this option are **32MB**, 64MB, 128MB, 256MB and 512MB.

AGP Operators

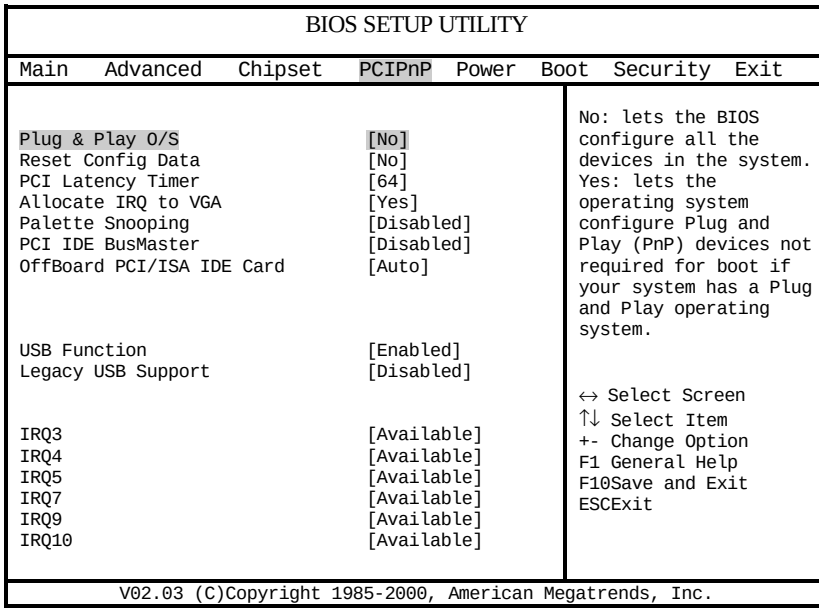
The settings for this option are Enabled and **Disabled**.

MPS 1.4 Support

The settings for this option are **Enabled** and Disabled.

7-6 PCI PnP Setup

Choose PCI/PnP Setup from the AMIBIOS Setup main menu. All PCI/PnP options are described in this section. The PCI/PnP Setup screen is shown below.



Plug & Play OS

Choose the **No** setting for computers that do not meet the Plug and Play specifications, which will allow the BIOS to configure all the devices in the system. Choosing the Yes setting lets the operating system configure PnP devices that are not required for boot up (if the system has a PnP operating system). The operating system would have the ability to change interrupt, I/O, and DMA settings. Set this option if the system is running Windows 95®, Windows 98® or Windows 2000®. Other operating systems are also PnP-aware.

Reset Configuration Data

Choosing the Yes setting will cause the PnP configuration data in the BIOS to be cleared on the next boot up. Choosing the **No** setting does not force PnP data to be cleared on the next boot.

PCI Latency Timer

This option specifies the latency timing of the PCI clocks for all PCI devices. Settings include 32, **64**, 96, 128, 160, 192, 224 and 248 PCI clocks.

Allocate IRQ to PCI VGA

This option lets you allocate an interrupt request (IRQ) to the PCI VGA adapter card (if used). The settings are **Yes** and No.

Palette Snooping

When enabled, this option informs PCI devices that an ISA graphics device is installed. The settings are **Disabled** and Enabled. This does not necessarily indicate a physical ISA adapter card. The graphics chipset can be mounted on a PCI card. Always check with your adapter card manuals first, before modifying the default settings in the BIOS.

PCI IDE BusMaster

This option allows an offboard PCI/ISA IDE card to be selected. The settings for this option are **Auto**, PCI Slot 1, PCI Slot 2, PCI Slot 3, PCI Slot 4, PCI Slot 5, PCI Slot 6.

OffBoard PCI/ISA IDE Card

The settings for this option are **Enabled** and Disabled.

USB Function

The settings for this option are Disabled and **Enabled**. Disabled prevents the use of the USB ports and Enabled allows the use of the USB ports.

Legacy USB Support

This option allows Legacy USB support. The settings are **Disabled**, Enabled and Auto. Disabled prevents the use of any USB device in DOS or during system boot. Enabled allows the use of USB devices during boot and while using DOS. The Auto setting auto detects USB keyboards or mice and if found, allows them to be utilized during boot and while using DOS.

IRQ 3

IRQ 4

IRQ 5

IRQ 7

IRQ 9

IRQ 10

IRQ 11

IRQ 14

IRQ 15

The settings for the above options are **Available** and Reserved. Available allows the specified IRQ to be available for use by PCI/PnP devices. Reserved means the specified IRQ is reserved for use by Legacy ISA devices.

DMA Channel 0

DMA Channel 1

DMA Channel 3

DMA Channel 5

DMA Channel 6

DMA Channel 7

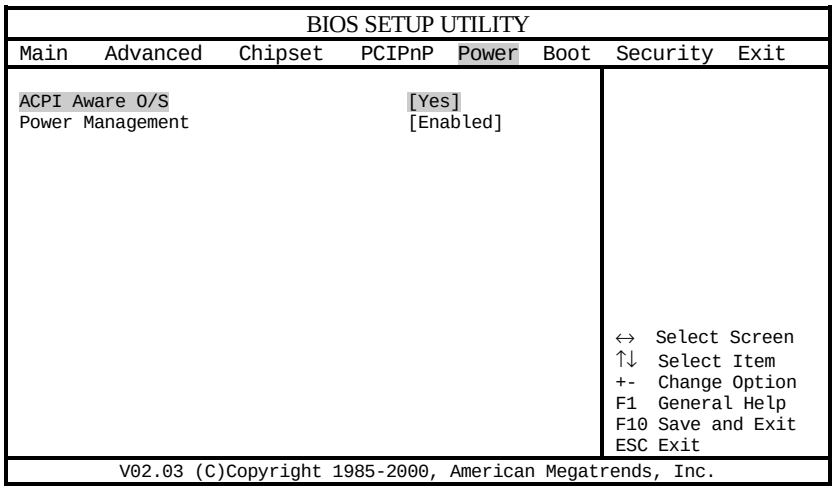
Each of the above list of DMA channel setting options can be set to **Available** and Reserved. Available means the specified DMA channel is available for use by PCI/PnP devices. Reserved means the specified DMA channel is reserved for use by Legacy ISA devices.

Reserved Memory Size

This option specifies the size of a memory area to be reserved for Legacy ISA adapter cards. The settings are **Disabled**, 16k, 32k and 64k.

7-7 Power Setup

Choose Power Setup from the AMIBIOS Setup main menu. All Power Setup options are described in this section. The Power Setup screen is shown below.



ACPI Aware O/S

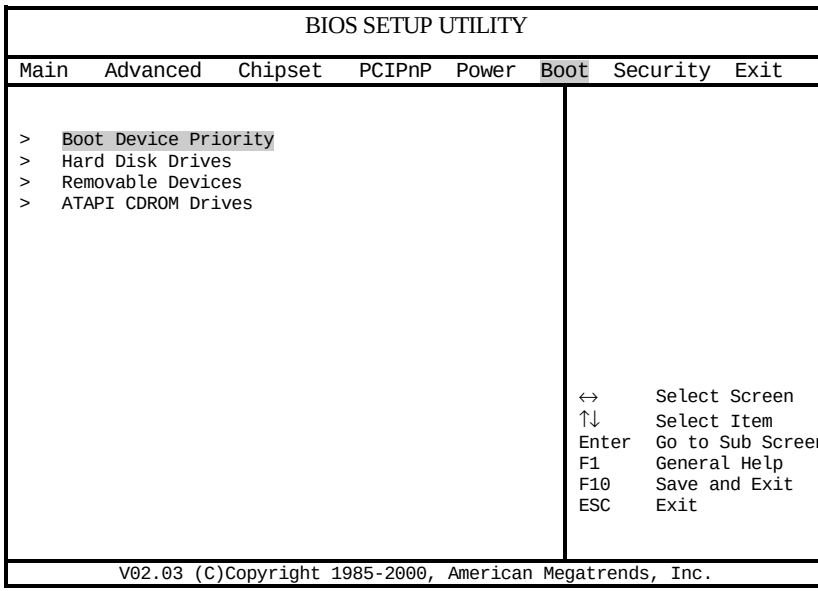
This option allows the system to utilize Intel's ACPI (Advanced Configuration and Power Interface) specification. Settings are No and **Yes**. DOS®, Windows 3.x®, and Windows NT® are examples of non-ACPI aware operating systems. Windows 95®, Windows 98® and Windows 2000® are examples of ACPI aware operating systems.

Power Management

This option allows you to select using APM (Advanced Power Management). The settings are **Disabled** and Enabled.

7-8 Boot Setup

Choose Boot Setup from the AMIBIOS Setup main menu. All Boot Setup options are described in this section. The Boot Setup screen is shown below.



Boot Device Priority

1st Boot Device

This option is used to specify the order of the boot sequence that will be followed from the available system devices. The settings for the 1st Boot Device are **Removable Device**, Hard Drive and ATAPI CDROM.

2nd Boot Device

The settings for the 2nd Boot Device are Removable Device, Hard Drive and **ATAPI CDROM**.

3rd Boot Device

The settings for the 3rd Boot Device are Removable Device, **Hard Drive** and ATAPI CDROM.

Hard Disk Drives

Use this screen to view the hard drives that have been auto-detected or entered manually on your system.

Removable Devices

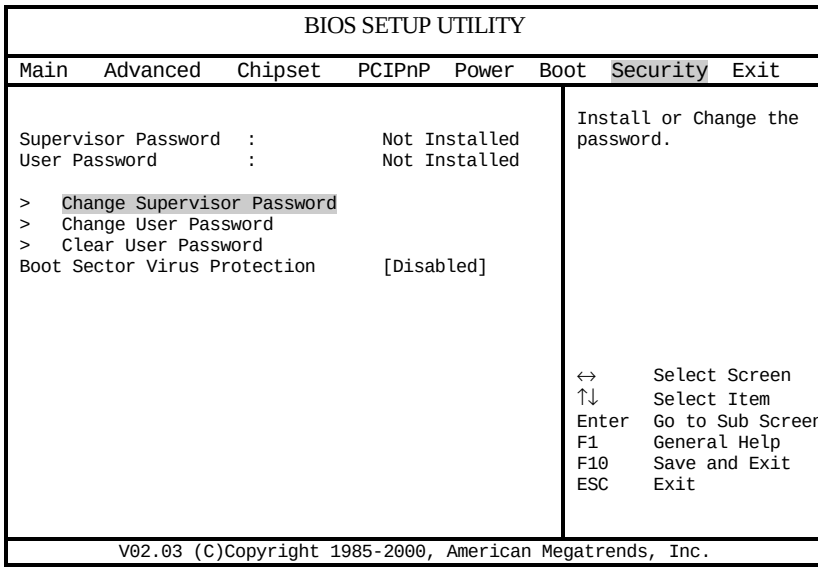
Use this screen to view the removeable devices that have been auto-detected or entered manually on your system.

ATAPI CDROM Drives

Use this screen to view the ATAPI CDROM drives that have been auto-detected or entered manually on your system.

7-9 Security Setup

Choose Security Setup from the AMIBIOS Setup main menu. All Security Setup options are described in this section. The Security Setup screen is shown below.



Supervisor Password

User Password

AMIBIOS provides both Supervisor and User password functions. If you use both passwords, the Supervisor password must be set first. The system can be configured so that all users must enter a password every time the system boots or when AMIBIOS Setup is executed, using either or both the Supervisor password or User password. The Supervisor and User passwords activate two different levels of password security. If you select password support, you are prompted for a 1 – 6 character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must clear CMOS and reconfigure. **Remember your Password!** Keep a record of the new password when the password is changed. If you forget the password, you must erase the system configuration information in CMOS.

Change Supervisor Password

This option allows you to change a supervisor password that was entered previously.

Change User Password

This option allows you to change a user password that was entered previously.

Clear User Password

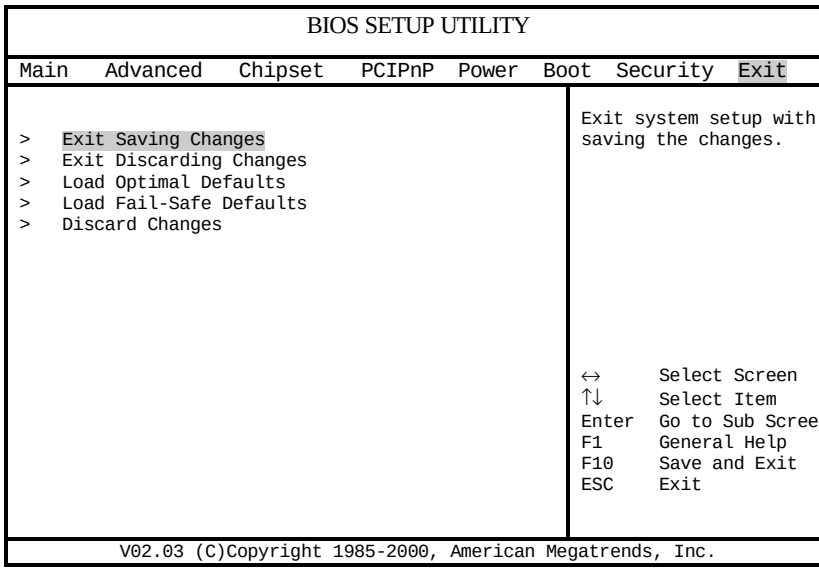
Use this option to clear the user password so that it is not required to be entered when the system boots up.

Boot Sector Virus Protection

This option allows you to enable or disable a virus detection program to protect the boot sector of your hard disk drive. The settings for this option **Disabled** and Enabled. If Enabled, AMIBIOS will display a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive.

7-10 Exit Setup

Choose Exit Setup from the AMIBIOS Setup main menu. All Exit Setup options are described in this section. The Exit Setup screen is shown below.



Exit Saving Changes

Highlighting this setting and then pressing <Enter> will save any changes you made in the BIOS Setup program and then exit. Your system should then continue with the boot up procedure.

Exit Discarding Changes

Highlighting this setting and then pressing <Enter> will ignore any changes you made in the BIOS Setup program and then exit. Your system should then continue with the boot up procedure.

Load Optimal Defaults

Highlighting this setting and then pressing <Enter> provides the optimum performance settings for all devices and system features.

Load Failsafe Defaults

Highlighting this setting and then pressing <Enter> provides the safest set of parameters for the system. Use them if the system is behaving erratically.

Discard Changes

Highlighting this setting and then pressing <Enter> will ignore any changes you made in the BIOS Setup program but will not exit the BIOS Setup program.

Appendix A

BIOS Error Beep Codes & Messages

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list, on the following page, correspond to the number of beeps for the corresponding error. All errors listed, with the exception of Beep Code 8, are fatal errors.

AMI BIOS Error Beep Codes

Beep Code	Error Message	Description
1 beep	Refresh	***The memory refresh circuitry on the motherboard is faulty***
2 beeps	BIOS ROM file absent	***The BIOS was unable to find the specific file name required to flash the BIOS***
3 beeps	Base 64KB memory failure	***Memory failure occurred in the first 64KB of Memory***
4 beeps	Flash program successful	***The flash was properly programmed with the BIOS ROM file.***
5 beeps	Media read error	***The floppy or ATAPI media is not presented or cannot be read***
6 beeps	Keyboard controller Gate A20 failure	***The keyboard controller may be bad. The BIOS cannot switch to protected mode.***
7 beeps	Processor exception interrupt error	***The CPU generated an exception interrupt***
8 beeps	Display memory read/write error	***The system video adapter is either missing or its memory is faulty. This is not a fatal error.***
10 beeps	Flash erase error	***The flash device was unable to be properly programmed.***
11 beeps	Flash program error	***The flash device was unable to be properly programmed.***
12 beeps	BIOS ROM file incorrect size	***The BIOS ROM file found does not match the size of the flash device***
13 beeps	BIOS ROM image mismatch	***The BIOS ROM file layout configuration does not match image present in the flash device.***
5 short +_1 long beeps	Memory Error	***No memory detected in the system***
6 short + 1 long beeps	Memory Error	***EDO memory detected in system***
7 short + 1 long beeps	SMBUS Error	***SMBUS error***

Appendix B
AMIBIOS POST Checkpoint Codes

When AMIBIOS performs the Power On Self Test, it writes diagnostic codes checkpoint codes to I/O port 0080h. If the computer cannot complete the boot process, diagnostic equipment can be attached to the computer to read I/O port 0080h.

B-1 Uncompressed Initialization Codes

The uncompressed initialization checkpoint codes are listed in order of execution:

Checkpoint Code	Description
D0h	The NMI is disabled. Power on delay is starting. Next, the initialization code checksum will be verified.
D1h	Initializing the DMA controller, performing the keyboard controller BAT test, starting memory refresh, and entering 4 GB flat mode next.
D3h	Starting memory sizing next.
D4h	Returning to real mode. Executing any OEM patches and setting the Stack next.
D5h	Passing control to the uncompressed code in shadow RAM at E000:0000h. The initialization code is copied to segment 0 and control will be transferred to segment 0.
D6h	Control is in segment 0. Next, checking if <Ctrl> <Home> was pressed and verifying the system BIOS checksum. If either <Ctrl> <Home> was pressed or the system BIOS checksum is bad, next will go to checkpoint code E0h. Otherwise, going to checkpoint code D7h.

B-2 Bootblock Recovery Codes

The bootblock recovery checkpoint codes are listed in order of execution:

Checkpoint Code	Description
E0h	The onboard floppy controller if available is initialized. Next, beginning the base 512 KB memory test.
E1h	Initializing the interrupt vector table next.
E2h	Initializing the DMA and Interrupt controllers next.
E6h	Enabling the floppy drive controller and Timer IRQs. Enabling internal cache memory.
Edh	Initializing the floppy drive.
Eeh	Looking for a floppy diskette in drive A:. Reading the first sector of the diskette.
Efh	A read error occurred while reading the floppy drive in drive A:.
F0h	Next, searching for the AMIBOOT.ROM file in the root directory.
F1h	The AMIBOOT.ROM file is not in the root directory.
F2h	Next, reading and analyzing the floppy diskette FAT to find the clusters occupied by the AMIBOOT.ROM file.
F3h	Next, reading the AMIBOOT.ROM file, cluster by cluster.
F4h	The AMIBOOT.ROM file is not the correct size.
F5h	Next, disabling internal cache memory.
FBh	Next, detecting the type of flash ROM.
FCh	Next, erasing the flash ROM.
FDh	Next, programming the flash ROM.
FFh	Flash ROM programming was successful. Next, restarting the system BIOS.

B-3 Uncompressed Initialization Codes

The following runtime checkpoint codes are listed in order of execution. These codes are uncompressed in F0000h shadow RAM.

Checkpoint Code	Description
03h	The NMI is disabled. Next, checking for a soft reset or a power on condition.
05h	The BIOS stack has been built. Next, disabling cache memory.
06h	Uncompressing the POST code next.
07h	Next, initializing the CPU and the CPU data area.
08h	The CMOS checksum calculation is done next.
0Ah	The CMOS checksum calculation is done. Initializing the CMOS status register for date and time next.
0Bh	The CMOS status register is initialized. Next, performing any required initialization before the keyboard BAT command is issued.
0Ch	The keyboard controller input buffer is free. Next, issuing the BAT command to the keyboard controller.
0Eh	The keyboard controller BAT command result has been verified. Next, performing any necessary initialization after the keyboard controller BAT command test.
0Fh	The initialization after the keyboard controller BAT command test is done. The keyboard command byte is written next.
10h	The keyboard controller command byte is written. Next, issuing the Pin 23 and 24 blocking and unblocking command.
11h	Next, checking if <End or <Ins> keys were pressed during power on. Initializing CMOS RAM if the *Initialize CMOS RAM in every boot* AMIBIOS POST option was set in AMIBCP or the <End> key was pressed.
12h	Next, disabling DMA controllers 1 and 2 and interrupt controllers 1 and 2.
13h	The video display has been disabled. Port B has been initialized. Next, initializing the chipset.
14h	The 8254 timer test will begin next.
19h	The 8254 timer test is over. Starting the memory refresh test next.
1Ah	The memory refresh line is toggling. Checking the 15 second on/off time next.
2Bh	Passing control to the video ROM to perform any required configuration before the video ROM test.
2Ch	All necessary processing before passing control to the video ROM is done. Looking for the video ROM next and passing control to it.
2Dh	The video ROM has returned control to BIOS POST. Performing any required processing after the video ROM had control.
23h	Reading the 8042 input port and disabling the MEGAKEY Green PC feature next. Making the BIOS code segment writable and performing any necessary configuration before initializing the interrupt vectors.
24h	The configuration required before interrupt vector initialization has completed. Interrupt vector initialization is about to begin.

Checkpoint Code	Description
25h	Interrupt vector initialization is done. Clearing the password if the POST DIAG switch is on.
27h	Any initialization before setting video mode will be done next.
28h	Initialization before setting the video mode is complete. Configuring the monochrome mode and color mode settings next.
2Ah	Bus initialization system, static, output devices will be done next, if present. See the last page for additional information.
2Eh	Completed post-video ROM test processing. If the EGA/VGA controller is not found, performing the display memory read/write test next.
2Fh	The EGA/VGA controller was not found. The display memory read/write test is about to begin.
30h	The display memory read/write test passed. Look for retrace checking next.
31h	The display memory read/write test or retrace checking failed. Performing the alternate display memory read/write test next.
32h	The alternate display memory read/write test passed. Looking for alternate display retrace checking next.
34h	Video display checking is over. Setting the display mode next.
37h	The display mode is set. Displaying the power on message next.
38h	Initializing the bus input, IPL, general devices next, if present. See the last page of this chapter for additional information.
39h	Displaying bus initialization error messages. See the last page of this chapter for additional information.
3Ah	The new cursor position has been read and saved. Displaying the *Hit <DEL>* message next.
3Bh	The *Hit <DEL>* message is displayed. The protected mode memory test is about to start.
40h	Preparing the descriptor tables next.
42h	The descriptor tables are prepared. Entering protected mode for the memory test next.
43h	Entered protected mode. Enabling interrupts for diagnostics mode next.
44h	Interrupts enabled if the diagnostics switch is on. Initializing data to check memory wraparound at 0:0 next.
45h	Data initialized. Checking for memory wraparound at 0:0 and finding the total system memory size next.
46h	The memory wraparound test is done. Memory size calculation has been done. Writing patterns to test memory next.
47h	The memory pattern has been written to extended memory. Writing patterns to the base 640 KB memory next.
48h	Patterns written in base memory. Determining the amount of memory below 1 MB next.
49h	The amount of memory below 1 MB has been found and verified. Determining the amount of memory above 1 MB memory next.

Checkpoint Code	Description
4Bh	The amount of memory above 1 MB has been found and verified. Checking for a soft reset and clearing the memory below 1 MB for the soft reset next. If this is a power on situation, going to checkpoint 4Eh next.
4Ch	The memory below 1 MB has been cleared via a soft reset. Clearing the memory above 1 MB next.
4Dh	The memory above 1 MB has been cleared via a soft reset. Saving the memory size next. Going to checkpoint 52h next.
4Eh	The memory test started, but not as the result of a soft reset. Displaying the first 64 KB memory size next.
4Fh	The memory size display has started. The display is updated during the memory test. Performing the sequential and random memory test next.
50h	The memory below 1 MB has been tested and initialized. Adjusting the displayed memory size for relocation and shadowing next.
51h	The memory size display was adjusted for relocation and shadowing. Testing the memory above 1 MB next.
52h	The memory above 1 MB has been tested and initialized. Saving the memory size information next.
53h	The memory size information and the CPU registers are saved. Entering real mode next.
54h	Shutdown was successful. The CPU is in real mode. Disabling the Gate A20 line, parity, and the NMI next.
57h	The A20 address line, parity, and the NMI are disabled. Adjusting the memory size depending on relocation and shadowing next.
58h	The memory size was adjusted for relocation and shadowing. Clearing the *Hit <DEL>* message next.
59h	The *Hit <DEL>* message is cleared. The *<WAIT...>* message is displayed. Starting the DMA and interrupt controller test next.

Checkpoint Code	Description
60h	The DMA page register test passed. Performing the DMA Controller 1 base register test next.
62h	The DMA controller 1 base register test passed. Performing the DMA controller 2 base register test next.
65h	The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next.
66h	Completed programming DMA controllers 1 and 2. Initializing the 8259 interrupt controller next.
67h	Completed 8259 interrupt controller initialization.
7Fh	Extended NMI source enabling is in progress.
80h	The keyboard test has started. Clearing the output buffer and checking for stuck keys. Issuing the keyboard reset command next.
81h	A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next.
82h	The keyboard controller interface test completed. Writing the command byte and initializing the circular buffer next.
83h	The command byte was written and global data initialization has completed. Checking for a locked key next.
84h	Locked key checking is over. Checking for a memory size mismatch with CMOS RAM data next.
85h	The memory size check is done. Displaying a soft error and checking for a password or bypassing WINBIOS Setup next.
86h	The password was checked. Performing any required programming before WINBIOS Setup next.
87h	The programming before WINBIOS Setup has completed. Uncompressing the WINBIOS Setup code and executing the AMIBIOS Setup or WINBIOS Setup utility next.
88h	Returned from WINBIOS Setup and cleared the screen. Performing any necessary programming after WINBIOS Setup next.

Checkpoint Code	Description
89h	The programming after WINBIOS Setup has completed. Displaying the power on screen message next.
8Bh	The first screen message has been displayed. The *<WAIT...>* message is displayed. Performing the PS/2 mouse check and extended BIOS data area allocation check next.
8Ch	Programming the WINBIOS Setup options next.
8Dh	The WINBIOS Setup options are programmed. Resetting the hard disk controller next.
8Fh	The hard disk controller has been reset. Configuring the floppy drive controller next.
91h	The floppy drive controller has been configured. Configuring the hard disk drive controller next.
95h	Initializing the bus option ROMs from C800 next. See the last page of this chapter for additional information.
96h	Initializing before passing control to the adaptor ROM at C800.
97h	Initialization before the C800 adaptor ROM gains control has completed. The adaptor ROM check is next.
98h	The adaptor ROM had control and has now returned control to BIOS POST. Performing any required processing after the option ROM returned control.
99h	Any initialization required after the option ROM test has completed. Configuring the timer data area and printer base address next.
9Ah	Set the timer and printer base addresses. Setting the RS-232 base address next.

Checkpoint Code	Description
9Bh	Returned after setting the RS-232 base address. Performing any required initialization before the Coprocessor test next.
9Ch	Required initialization before the Coprocessor test is over. Initializing the Coprocessor next.
9Dh	Coprocessor initialized. Performing any required initialization after the Coprocessor test next.
9Eh	Initialization after the Coprocessor test is complete. Checking the extended keyboard, keyboard ID, and Num Lock key next. Issuing the keyboard ID command next.
A2h	Displaying any soft errors next.
A3h	The soft error display has completed. Setting the keyboard typematic rate next.
A4h	The keyboard typematic rate is set. Programming the memory wait states next.
A5h	Memory wait state programming is over. Clearing the screen and enabling parity and the NMI next.
A7h	NMI and parity enabled. Performing any initialization required before passing control to the adaptor ROM at E000 next.
A8h	Initialization before passing control to the adaptor ROM at E000h completed. Passing control to the adaptor ROM at E000h next.
A9h	Returned from adaptor ROM at E000h control. Performing any initialization required after the E000 option ROM had control next.
Aah	Initialization after E000 option ROM control has completed. Displaying the system configuration next.
Abh	Uncompressing the DMI data and executing DMI POST initialization next.
B0h	The system configuration is displayed.
B1h	Copying any code to specific areas.
00h	Code copying to specific areas is done. Passing control to INT 19h boot loader next.

B-4 Bus Checkpoint Codes

The system BIOS passes control to different buses at the following checkpoints:

Checkpoint Code	Description
2Ah	Initializing the different bus system, static, and output devices, if present.
38h	Initialized bus input, IPL, and general devices, if present.
39h	Displaying bus initialization error messages, if any.
95h	Initializing bus adaptor ROMs from C8000h through D8000h.

Additional Bus Checkpoints

While control is inside the different bus routines, additional checkpoints are output to I/O port address 0080h as word to identify the routines being executed. These are word checkpoints.

The low byte of checkpoint is the system BIOS checkpoint where control is passed to the different bus routines.

The high byte of checkpoint indicates that the routine is being executed in Different buses.

High Byte

The high byte of these checkpoints includes the following information:

Bits	Description
Bits 7-4	
0000	Function 0. Disable all devices on the bus.
0001	Function 1. Initialize static devices on the bus.
0010	Function 2. Initialize output devices on the bus.
0011	Function 3. Initialize input devices on the bus.
0100	Function 4. Initialize IPL devices on the bus.
0101	Function 5. Initiate general devices on the bus.
0110	Function 6. Initialize error reporting on the bus.
0111	Function 7. Initialize add-on ROMs for all buses.

Bits 3-0 Specify the bus

0	Generic DIM Device Initialization Manager.
1	Onboard System devices.
2	ISA devices.
3	EISA devices.
4	ISA PnP devices.
5	PCI devices.

Notes

Appendix C

List of Figures

Notes

Appendix D

System Specifications

Processors

One or two 370-pin Intel Pentium III FCPGA 500 MHz - 1 GHz CPUs with a 133 or 100 MHz FSB

Memory Capacity

4 DIMM slots to support a maximum of 4 GB ECC registered SDRAM

DIMM Sizes

128 MB / 256 MB / 512 MB / 1 GB SDRAM modules supported

SCSI Controller

Adaptec AIC-7899 for dual channel Ultra160 SCSI

SCSI Backplane Controller

QLogic GEM354 controller for SAF-TE compliant SCA backplane

SCSI Drive Bays

Two (2) drive bays to house two (2) standard **1" 80-pin** SCA SCSI drives

Peripheral Bays

One (1) 3.5" floppy drive
One (1) slim CD-ROM drive
Two (2) 3.5 x 1" drive bays (for SCSI drives)

PCI Expansion Slot

One (1) onboard 64-bit 66 MHz (3.3V) PCI slot (backward compatible with Supermicro 1U 64-bit 66MHz 3.3V Riser Card, *Default-- bundled with 64-bit 33 MHz 5V Riser Card)

Power Supply

Type: 1 x 250W with +3.3V, +5V, +12V, -5V and -12V main DC outputs and a 5V standby output.
Input Voltage: 100-240VAC (w/ ± 10% tolerance (units are auto-switching capable)
Fans: Two 4-cm ball bearing fans
Operating Temperature Range: 0 to 40 degrees C
Humidity Range: 5-90%, non-condensing
Safety Regulations: UL 1950, CUL, TUV
EMI: FCC part 15, CISPR 22 (EN 55022)

Cooling Fans

System: One (1) 10-cm ball bearing blower fan
Optional: One (1) 4-cm ball bearing fan
Onboard Fan Headers: Two (2) CPU, two (2) chassis and two (2) overheat fan headers; max. current = .035 amps/ea. or 1.2 amps/set of four

Form Factor: 370DER+ motherboard: Full ATX
SC810 chassis: 1U rackmount

Operating Systems Supported: Windows NT, Windows 2000, Solaris, Netware, SCO UNIX and Linux

Dimensions: 16.7 x 1.7 x 22.7 in.; 425 x 44 x 560 mm (W x H x D)

Weight: Net: Full System: ~26 lbs. (11.8 kg.)
Gross: Full System: ~32 lbs. (14.5 kg.)

Regulations: FCC Class B, CE, UL, TUV